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Heavy Chicago Steel Business Large Transactions in Basic Pig Iron

Low Prices on Fabricating Contracts

The most interesting bit of news in trade circles is the fact that a Chicago subsidiary of the United States Steel Corporation booked orders the past week for about 100,000 tons of steel products for early shipment. This is about double its normal weekly bookings. The greater portion of the material sold consisted of rails and track fastenings, but structural shapes, plates and bars figured in the tonnage to quite an extent. It is understood that some of the business thus taken was for export. As compared with May, the month of June had shown an increase of 50 per cent. in this company's bookings, but July thus far has made a much better showing than June.

Conditions in finished lines appear to have been somewhat better in Chicago than in Pittsburgh, where the volume of business seems to have been running along in about the same volume as for the previous week. The steel mills in the vicinity of Pittsburgh are reported to be operating on an average of between 60 and 65 per cent. of full capacity, with their activities dependent chiefly upon orders received from day to day. The most active line in that market is probably sheets, the quietest being wire products, in which respect this branch of trade stands between seasons. Steel bars rank next to sheets in activity, while merchant pipe, like wire, is seasonably quiet. Plates, shapes and rails fall between. In all lines a marked improvement is looked for within a few weeks.

The steel plants of the United States Steel Corporation as a whole are operating at a better rate than that given for the Pittsburgh mills in general. Last week the corporation's plants were operated to 70 per cent. of their steel ingot capacity, and are scheduled to run at 69 per cent. this week.

Chicago has shown greater activity in structural lines than other trade centers, as the fabricating contracts closed there in the past week aggregate about 16,000 tons, among which was a bridge for the Atchison, Topeka & Santa Fe Railroad, about 10,000 tons, and a local telephone building, about 5000 tons. In New York City and vicinity the structural contracts of the week have been few and small, the largest being less than 1500 tons. It is somewhat disquieting to learn that extremely low prices are again being made on fabricating contracts, as it had been supposed that fabricating shops had become fairly well supplied with work for the rest of the summer and that competition would, therefore, not be so keen as earlier in the year.

The pig iron market is improving very slightly. Prices show firmness in some sections, while they are soft in others. Efforts are being made to secure a little higher price in eastern Pennsylvania and at Buffalo, but in the Central West it appears that some ground has been lost in the movement to get higher prices on basic. Pig iron stocks, however, are being

reduced to some extent. Stocks at independent furnaces in western Pennsylvania and Ohio were lowered 11,400 tons in the first half of this month and reports from other sections indicate similar conditions. Some large transactions have occurred in eastern Pennsylvania, but principally in low grades for the requirements of cast iron pipe foundries, although consumers of foundry irons are also taking fair-sized quantities for delivery through the remainder of the year. The Cincinnati market does not show the activity which had been expected, as fewer inquiries are being received in that market for prices on round lots. Good sales of basic pig iron have been made in the valleys, one transaction calling for 60,000 tons, and the demand for foundry iron is also better in that part of the country.

The demand for iron ore at Cleveland is showing some improvement. A round tonnage of non-Bessemer ore was sold last week, this having been the first ore sale of any size for some time.

The machinery trade is developing more life. Enterprises which have been hanging fire for months are being revived and better buying of power generators and other plant equipment is promised.

Steel Mill Labor and Hot Weather

It has been remarked in the past fortnight, in some at least of the steel producing districts, that the men stand extremely hot weather better than they did a few years ago. While there has been considerable interference with operations by the hot weather recently, it is observed that in the old days similar weather would have produced a great deal more trouble.

Several causes are likely to be assigned for such change as is noted. There is, of course, some difference in the mills themselves. There are more well-arranged plants than formerly, because the new plants are naturally designed better, and in recent years the old practice of squeezing additional equipment into the old building has not been followed as much as formerly. In certain cases there is a definite purpose to procure better working conditions by the equipment being spread out. In the case of tin and sheet mills the ventilating system has come much into vogue in the past three years, a large volume of outside air being conducted to the train of hot rolls, with a release at each stand of rolls. The majority of new plants built lately have been thus equipped and many old plants have had the system installed.

That the change mentioned is not altogether due to improvements in mill conditions is evidenced by testimony at hand, relating to a large steel plant conducting a variety of operations, and which has not been materially altered in the recent past, yet the observation as to this plant is unmistakable that in the past few weeks the men have suffered much less than in former years under similar weather conditions. There appears to be a difference in the men themselves, and for this their progress in sanitation and hygiene is held largely responsible. The skilled workmen, the rollers and heaters in sheet and tin mills in particular, have long known how to "train" for their work, regulating their diet and clothing and in many cases their drink. The common labor in the steel mills has had no such personal knowledge, but has rather grown up to the conditions. The ordinary men have become accustomed to steel mill conditions merely through habit, which

accounts for their being able to work in temperatures which they could not bear in the open air under the sun, although the man accustomed to such outdoor work would quickly succumb in the steel mill. This class of labor has probably learned little, but it is living year by year under more sanitary conditions, and the health laws of the various States have probably operated to improve its position.

There is an excellent field for humanitarian work along these lines. Present-day thought is running very strongly toward prevention of accidents and the installation of safety devices, while so far as we know, relatively little attention has been paid to the cultivation of knowledge among the men which will help them resist the effects of very hot weather. A series of simple lessons could be arranged which would undoubtedly have a marked effect in lessening the number of prostrations and deaths due to the heat in summer. Work of this sort merits more serious attention than has been given it. The fact that it is not spectacular, as is the installation of safety devices, does not lessen the promised benefit, while there is the not inconsequential feature that the expense would be practically nil.

Problem in Steel Tempering

One of the little things, and yet most bothersome, with which erectors of structural steel have to contend is the breaking of rivet snaps such as are commonly used in air hammers. These tools are usually sold at \$1.25 to \$1.75 apiece, but the breakage is so great that not only do the number of sets required run the purchase price into a very considerable amount, but the time lost in placing new stools in the guns is the occasion for an unwarranted expense and annoyance. It is the common practice in the erection of structural steel buildings to have one man in charge of various tools used in the building, and he is generally located on the ground floor. The workman doing the riveting has with him only the snap he is using, and when it breaks it necessitates sending down to the tool room for a new one. On a building in process of erection, and particularly when the work is in the upper stories, the cost of this change in loss of time is almost equivalent to the value of the rivet set itself.

Makers of these tools have been acquainted with the trying conditions and have not lacked information as to the failure of the tools in question. Formerly rivet sets for percussion work were made exclusively from carbon tool steel, and experimentation was in the direction of varying the heat treatment in tempering these tools. Some modifications in the design of the tools were also made. For example, it was found that breakages commonly occur in the shank of the tools right at the fillet where the head begins. The common breaking at this one point came to be considered as due, aside from natural crystallization, to excessive leverage arising from the great length of the head under the severe conditions of riveting at the various angles required in structural work. The head was accordingly shortened, and somewhat better results were then obtained.

It has been found, however, that failure of these tools results as frequently from improper manufacture as from any other cause. The difficulty of properly tempering steel to give uniform results for very severe service, such as riveting, is well known, but the frequency with which tools containing water cracks and

tempered too hard are sold has been particularly exasperating. Recent experiments seem to have shown conclusively that rivet sets can easily be tempered too hard, for tools so soft in the cup as to readily show the marks of riveting when reamed out after some service have given a very satisfactory life. The conclusion which may be drawn from this seems to be that the crystalizing action set up in the tool from the constant hammering results in the easy breakage of the tool tempered too hard, while it improves the structure of the softer steel.

Rather serious investigation by the manufacturer in the direction of using alloy steels has brought into the market various tools in which nickel, chrome and vanadium alloy steels have been used. Claims of greatly superior service have been made for these steels, but experience thus far seems to indicate that they are as uncertain as the carbon tool steel. It is true that tools made of alloy steel have in several instances shown exceptional endurance. This would seem to indicate that, when properly treated in manufacture, these steels possess superior advantages for this class of work. But the great difficulty still remains that they are unreliable. To the end that a better average life may be obtained from these rivet snaps, it would seem exceedingly desirable that manufacturers concentrate serious efforts upon the more careful manufacturing methods and treatment of the steels in the making of these sets.

The extent to which such tools are used and the value of a satisfactory article may be indicated in the fact that one manufacturer of pneumatic hammers alone contracted to take 25,000 snaps during the current year. Rivet sets with which from 15,000 to 20,000 rivets may be driven uniformly would be indeed of one carrying this burden.

A Model Navy Repair Ship

In the report of the Secretary of the Navy, which will be a basis for the next appropriation for naval construction, he dwells on the urgent need of a new repair ship. The navy has the *Vulcan*, equipped as a floating shop, but not only is one such vessel insufficient for so large a naval establishment, but the ship is rather a makeshift, being a converted merchantman. The growing size and power of ships must increase the amount of urgent repair work. Each vessel has its own machine shop which is supposed to take care of the ordinary run of mishaps. A repair ship goes beyond this. It should contain shops of sufficient size and variety of equipment to do practically anything that is possible outside of a dry dock. It should have a speed which would maintain its place with the fighting ships. In time of war the mobile repair base will become an imperative necessity. Its presence or its absence would determine to some degree the radius of activity of a fleet. In time of peace on long cruises it must have an important influence in maintaining a squadron intact, because at times it does away with the necessity of sending vessels to a yard.

Regarding the subject from an economic standpoint, it presents two aspects. The navy is adopting an efficiency system with the purpose of reducing its cost of maintenance to a minimum. Already large economies have been effected and the saving should reach a higher percentage each year for some time to come. One of the elementary and very important factors in an efficiency system is, of course, the equipment. It is not possible that the *Vulcan* can do work

at so low a cost as a larger vessel designed throughout for the specialized purpose of repair work at sea. In handling work alone the economy of time and money would be something not to be lost sight of. The mere fact that the new ship would be able to keep a battleship with the fleet as against the alternative of a run to a navy yard should figure into many thousands of dollars annually.

The second point is that the model repair ship would constitute a magnificent traveling exposition of American machine tools and other equipment. Sailing with a fleet, it would visit many ports in many lands, where it would be open to the inspection of visitors. They would include buyers who would gladly avail themselves of the opportunity to see high-class machinery in practical operation. It is to be hoped that the President and Congress will consider the recommendation of the Secretary of the Navy in all of these various aspects, and not consider the ship in the light of a fighting unit that demands rather than conserves expense.

An Undeveloped Asset

Akin to the wide extension of credit of the present day is the custom of capitalizing "good will"; it is something belonging to this age, a natural consequence of the times. Just as credit is founded upon an assumption as to the average moral integrity of the business world, so is the consideration of good will as an asset based upon an assumption that the present good status of a concern will continue in the future. There is nothing certain about either credit or good will; at least, nothing as dependable as the value of ordinary commodities, such as buildings, machinery, or the like.

We frequently hear of instances of an unwise extension of credit, of the almost instant reduction in the value of good will from many thousands of dollars to nothing. In spite of the instability of the value of good will, there is doubtless no parallel case in which such enormous valuation has been given to so uncertain a quantity. With some great corporations, a considerable part of the capitalization at their formation represented no tangible property, being instead an assumed value for an ability to make profits. The justice of such capitalization is still in the process of being tested, but that good will does possess a value which is just as apparent in profit making as a splendid shop or an efficient selling organization is not to be denied. Good will, or whatever other name may be chosen to call what it represents, is something much to be sought; not easily attained. Like many things in this world which are worth while, it is slowly gained and quickly lost.

When good will, profit-making ability, springs from a monopoly, more or less, in the manufacture and sale of any commodity, the justice in its capitalization is not clear to the average American citizen; but when such good will is the result of, and the indication of, a good honest business character, when it has been earned or built up by an effort on the part of the concern to do the square thing to its customers, there arises less antagonism to its profiting by the fruits of its honest effort to do business in a straightforward way.

To one who may be making a study of social conditions and especially those conditions as they exist in manufacturing plants, to one who likewise is cognizant of how much effort is being made to secure the good will of which we have spoken, it seems quite incon-

sistent that so little effort should be made by employers to secure the good will of their help. It is not that good will is altogether lacking between employer and employee; it is simply that not enough attention is paid to increasing this asset. Labor is really doubly an asset. It is an asset in the same way as is the machinery in which a huge amount may be invested; it is an asset because of its latent productive capacity—not the ordinary capacity for which the customary day's wage is willingly paid, but the capacity that lies ready to respond to the kindly word, the recognition of efficiency, the offer of additional income.

And if, perhaps, we can be convinced that the crowds that swarm into our shop yards and out again at the whistle's call have in them this latent productive capacity, are we not guilty of countenancing a waste, of being feeble conservationists? And are we not failing to develop an asset having a direct bearing on the year's profit and loss statement? Good will from one's customers has carried many a concern over a rough passage; good will on the part of the help is of far greater significance than is generally understood. Sometimes it seems as if there existed a premium on insincerity, so that it is hard for an employer to know just how he stands with his help. A little thought and retrospection will tell him whether he has really striven to obtain the good will of his men or not. They will never tell him themselves. It is not customary for them to do so. But if he will really study how best such good will can be strengthened and built up, and if he will do what he can to develop this asset, he will find that he does not have to be told how he stands with his help; he will know instinctively that he has won their loyalty and has won it only because he has deserved it. A great many unlooked-for responsibilities attach to the calling of the manager of property and men. Full appreciation of their gravity ought to possess all who answer to such a calling, and an efficient stewardship be given. Moreover, complacency should be one of the last emotions to enter the breast of one carrying this burden.

The Campaign Against Factory Fires

The campaign for the prevention of fires in manufacturing establishments appears to be gaining momentum as time goes on. The latest movements are those of the State of Pennsylvania providing for a compulsory fire drill in industrial establishments where women and girls are employed, and of the fire marshal of the State of Michigan in ridding factories, as well as other buildings, of accumulations of rubbish.

The Pennsylvania statute, which has just received the governors signature, provides that a fire drill shall take place not less than once a month, and that the persons employed shall be instructed in and made familiar with the use of the fire escapes and appliances and exits, which shall be actually employed while all persons are removed in an expeditious and orderly manner to a place of safety on the ground outside. The enforcement of the law is made mandatory upon the fire marshal in cities of the first and second class and upon the department of factory inspection elsewhere, the penalty for non-compliance being a minimum fine of \$25 with imprisonment for a minimum period of 10 days. Probably most employers will welcome this law as one tending to fix responsibility and to reveal the failure to carry out factory rules as to fire prevention.

In Michigan the fire marshal has designated Tuesday, July 25, as "cleaning day." He has requested the chiefs of fire departments and village officials, and instructed deputy fire marshals throughout the State, to make it their special business to see that the provision of the law requiring the cleaning up of rubbish be strictly enforced, and to urge upon the public the importance of keeping their premises clean thereafter.

Those persons who have occasion to visit many manufacturing establishments cannot help being impressed by the frequent cases where inflammable rubbish is present, sometimes in dangerous proximity to valuable equipment and materials. Constant vigilance is necessary if the results of native untidiness, which exists in many men, are to be prevented. In one recent case the pit of an elevator well was seen to contain a mass of debris of wood and paper, thickly covered with dust, proving that it had been there for a long time. Few more dangerous places for such accumulations could be found. Out-of-the-way corners are favorite receptacles for rubbish that a lighted match or a short-circuited wire would quickly cause to burst into flames. It has frequently been urged from many sources that greater care be taken in this detail of factory management. A significant percentage of disastrous fires in manufacturing plants is due to this form of shiftlessness.

Warning Against Subscription Impostors

Certain subscription agents, who have formerly represented the David Williams Company, and others who have never been authorized to solicit subscriptions for us, have recently been securing subscription orders and making collections under false pretenses.

Every agent authorized to solicit subscriptions or make collections on *The Iron Age*, *Iron Age-Hardware*, *Metal Worker* or *Building Age* is furnished with proper credentials to that effect, signed by the circulation manager of this company, and with a definite time limit stated therein.

Subscribers are requested to insist that such credentials be shown them before paying any money to subscription agents, and it is also strongly urged that any irregularities be reported promptly to the New York office.

DAVID WILLIAMS COMPANY,
239 West 39th street, New York.

The Standard Tool Company, Cleveland, Ohio, announces the opening of a Western branch at 552 West Washington boulevard, Chicago. In this store a complete stock of all styles of twist drills, reamers, milling cutters, taps, drill chucks, taper pins, etc., manufactured by the company will be carried, enabling immediate delivery to be made on orders. The convenience of the new arrangement will doubtless be appreciated by the company's Western trade.

The annual report of the Commissioner of Patents for the year 1910 has been issued. The volume is a most extensive work, covering 1089 pages, most of which space is given up to indexing the patents. The opening pages are devoted to the report of the commissioner, as sent to the House of Representatives in February.

The Stanley Committee has adopted a resolution for a searching scrutiny of books, papers and accounts of the United States Steel Corporation. This work will be done by Farquhar McRae, expert accountant in the employ of the committee. The committee will begin public hearings in New York July 27.

The Strauss Bascule Bridge Company, 901-904 Fort Dearborn Building, Chicago, has received, as consulting engineer, an order for plans for a 60-ft. clear span bascule of its design, which will be built over the Old Basin Canal, Hagan avenue, New Orleans. Bids for the work will probably be asked by the city in about two months.

Engineers Inspect Panama Canal Gates

The McClintic-Marshall Construction Company, Pittsburgh, on Saturday, July 15, took a party of about 250, composed principally of members of the Engineers' Society of Western Pennsylvania, to its large fabricating shops at Rankin, Pa., for an inspection of the Isthmian Canal lock gates now in course of construction. The visitors were taken in special cars over the Baltimore & Ohio Railroad. Luncheon was served the party in the company's dining room, after which the callers were taken in charge by E. W. Pittmann, manager of the Rankin plant, and various other officials and representatives. The party was divided into squads to enable everyone to hear the guides' explanations.

The contract for the gates amounts to considerably over \$5,000,000. Forty-six pairs, or 92 leaves, of mitering lock gates are to be used in the three locks of the canal, and the contract will call for 58,000 tons of structural steel work and steel castings. The length of each of these leaves is 64.912 ft., center to center of bearings, and their heights vary from 47 ft. 5 in. to 82 ft. Each leaf will consist essentially of a system of horizontal girders, vertical end girders, frames, diaphragms and intercostals, forming its skeleton, and of a steel plate sheathing extending from the top to the bottom on both sides of the leaf. The leaf will be swung by means of a stiff strut fastened to it at the top and operated by an electrically driven engine located in the lock wall, and drawn into proper position and held tightly there by a mitering device at the miter ends.

A steel manshaft will extend from the top of the air chamber to the top of the leaf and will have a manhole at the top. In each leaf will be five transverse vertical frames built in between the horizontal girders and extending from the bottom to the top of the leaf, three of which are to be made water-tight within the air chamber. Each frame will have a manhole cut in the web so that free access can be had to all parts of the leaf. All the horizontal girders except the bottom girders are to have similar manholes.

The construction of the lock gates and of several large bridges recently constructed by the McClintic-Marshall Construction Company, notably the Beaver bridge over the Ohio River, for the Pittsburgh & Lake Erie Railroad Company, and the Missouri River bridge at Kansas City, for the Union Depot Bridge & Terminal Railway Company, have required the installation at the plant of a large amount of new machinery and special equipment of the highest character. The general excellence of the workmanship on these structures was not demanded nor deemed possible of attainment until very recent years.

The Rankin shops are of the most modern and efficient arrangement and comprise duplicate plants, each having a capacity of over 4000 tons of finished structural material per month. They have facilities for shipment both by rail and water. In addition to the Rankin shops, the company operates plants at Carnegie and Pottstown, Pa., the capacity of the works aggregating over 150,000 tons per year.

The inspection of the Panama gates at Rankin took up the afternoon, the engineers getting back to Pittsburgh about 5 o'clock. The McClintic-Marshall Construction Company gave each visitor a copy of an illustrated booklet that had been specially prepared, which contained views of the gates and sectional cuts, together with a view of Culebra cut, a map of the canal zone and a description.

H. J. Koontz, dealer in second-hand machinery and other equipment, has removed his offices from the Farmers' Bank Building to 1931 Carson street, South Side, Pittsburgh, where he has secured a large warehouse.

The Keystone Bronze Company, Pittsburgh, Pa., has placed a contract with the Penn Bridge Company, Beaver Falls, Pa., for an extension to the foundry building at its Brighton Works, New Brighton, Pa.

The Newport Rolling Mill Company, Newport, Ky., whose mills have been closed down for the usual annual repairs, will resume operations July 24.

The Russian Duty on Pig Iron.—The Council of Ministers has been empowered, on receiving special applications, to authorize, on the following conditions, the import from abroad till July 1, 1912, at reduced rates of customs duty, of pig iron for the needs of the iron and steel industry: The total amount of this pig iron is not to exceed 10,000,000 poods (161,210 tons). Any iron and steel company is authorized to import, at reduced rates of customs duty, pig iron to an amount not exceeding its average quarterly pig-iron consumption during its last operating year. The extent of the reduction of customs duty is to be determined separately in each case. On dispatch of the pig iron from the customs house the owners must lodge a deposit guaranteeing payment of the full duty, and, later, on documentary proof being submitted that the pig iron has been delivered at the works designated in the permit, the owners will pay the reduced rate only, fixed in each case by the Council of Ministers.

The Heppenstall Forge & Knife Company's Improvements.—The Heppenstall Forge & Knife Company, Forty-seventh street, Pittsburgh, has completed plans for the erection of an addition to its plant. New steel buildings are to be erected on the site formerly occupied by the Velte Foundry & Machine Company. A forging shop and machine shop are to be fitted up. The former will be equipped with steam hydraulic hammers and the machine shop with a complete line of modern electrically operated machine tools for the manufacture of axles, shafting and heavier forgings. Inquiries out call for a complete line of machine tools, two 30-ton four motor cranes and a 30-ton three motor crane, the latter for serving the storage yard. The additions will be completed and ready for operation early in September and will practically double the company's present capacity for the manufacture of hammered forgings, shaftings, shear knives, die blocks, etc.

Recent orders taken by the C. O. Bartlett & Snow Company, Cleveland, Ohio, include the following: Coal handling plant for the Chicago & Northwestern Railroad at Chicago, including 600-ton storage, track hopper, crusher, elevator, and distributing hopper and distributing conveyor; a 4-roll crusher for the Twin City Rapid Transit Company, Minneapolis, Minn.; three double skip hoists for the Pennsylvania Salt Mfg. Company, Philadelphia; a single skip hoist for the American Steel & Wire Company, Cleveland; coal handling plant for Harvey Brothers, Cleveland; five conveyors for the Barrett Mfg. Company, Philadelphia.

C. W. Leavitt & Co., 30 Church street, New York, state that "another well-known American steel company whose name and plans cannot be disclosed at this time has signed a contract for license to use the Girod electric furnace; the company manufactures the highest grade of steel castings and other forms of steel of high quality."

The Laclede Steel Company, recently organized and ultimately to have a capital stock of \$500,000, has decided to locate its plant at Madison, Ill., across the river from the northern end of St. Louis. Work will begin immediately on the buildings. The plant will be thoroughly modern and will be laid out in unit form in order to enable extensions as business grows. Among the specialties of the company will be steel for reinforced concrete work and shapes for agricultural implements.

Tate, Jones & Co., Inc., Pittsburgh, Pa., report late sales of their new type of heat treating furnaces to the Simplex Motor Car Company, M. Hoagland & Sons Company, Pacific Tool & Supply Company, Erie City Iron Works, Rogers-Shear Company, Mattatuck Mfg. Company, and Keystone Steel & Wire Company.

The foreign commerce of the United States in the fiscal year ended June 30 was the largest in our history. The total passed for the first time the \$3,500,000,000 line. The exports passed for the first time the \$2,000,000,000 line, and the imports were only exceeded in value by one earlier year, 1910. The excess of exports over imports was \$521,000,000, a sum greater than in any year since 1901, save in the high record year 1908, when the excess was \$666,500,000.

The Iron and Metal Markets

Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

PIG IRON, Per Gross Ton:	July 19 1911.	July 12 1911.	June 21 1911.	July 20 1910.
Foundry No. 2 standard, Phila- delphia.....	\$15.00	\$15.00	\$15.25	\$16.25
Foundry No. 2, Valley furnace.....	13.50	13.50	13.50	14.25
Foundry No. 2 Southern, Cin- cinnati.....	13.25	13.25	13.25	14.75
Foundry No. 2, Birmingham, Ala. Foundry No. 2, at furnace, Chicago.....	10.00	10.00	10.00	11.50
Basic, delivered, eastern Pa.....	14.25	14.25	14.50	15.75
Basic, Valley furnace.....	13.00	13.25	13.00	14.50
Bessemer, Pittsburgh.....	15.90	15.90	15.90	16.40
Gray forge, Pittsburgh.....	13.90	13.90	13.90	14.40
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50

COKE, CONNELLSVILLE,

Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	1.40	1.40	1.40	1.60
Furnace coke, future delivery..	1.55	1.55	1.60	1.80
Foundry coke, prompt shipment.	1.80	1.80	1.75	2.15
Foundry coke, future delivery..	2.00	2.05	2.05	2.25

BILLETS, &c., Per Gross Ton:

Bessemer billets, Pittsburgh....	21.00	21.00	21.00	25.00
Forging billets, Pittsburgh.....	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia.	23.40	23.40	23.40	28.50
Wire rods, Pittsburgh.....	27.00	27.00	27.00	29.00

OLD MATERIAL, Per Gross Ton:

Iron rails, Chicago.....	14.00	14.00	14.00	16.75
Iron rails, Philadelphia.....	17.50	16.75	16.50	18.50
Car wheels, Chicago.....	12.50	12.50	12.50	14.75
Car wheels, Philadelphia.....	13.00	12.75	13.00	14.00
Heavy steel scrap, Pittsburgh.....	13.00	13.00	13.00	14.50
Heavy steel scrap, Chicago.....	10.50	10.50	10.25	12.25
Heavy steel scrap, Philadelphia..	13.25	13.00	13.00	14.00

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill..	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia.	1.27½	1.27½	1.27½	1.45
Common iron bars, Pittsburgh..	1.25	1.25	1.25	1.50
Common iron bars, Chicago.....	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh.....	1.25	1.25	1.25	1.45
Steel bars, tidewater, New York	1.41	1.41	1.41	1.61
Tank plates, Pittsburgh.....	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh.....	1.35	1.35	1.35	1.40
Beams, tidewater, New York....	1.51	1.51	1.51	1.56
Angles, Pittsburgh.....	1.35	1.35	1.35	1.40
Angles, tidewater, New York....	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.50
Skelp, sheared steel, Pittsburgh..	1.35	1.35	1.35	1.60

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.30
Wire nails, Pittsburgh.....	1.70	1.70	1.70	1.70
Cut nails, Pittsburgh.....	1.60	1.60	1.60	1.65
Barb wire, galvanized, Pittsburgh†	2.00	2.00	2.00	2.00

METALS,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York.....	12.75	12.75	12.75	12.62½
Electrolytic copper, New York..	12.55	12.55	12.50	12.25
Spelter, St. Louis.....	5.57½	5.60	5.55	5.05
Spelter, New York.....	5.75	5.80	5.75	5.20
Lead, St. Louis.....	4.40	4.35	4.35	4.25
Lead, New York.....	4.50	4.50	4.50	4.40
Tin, New York.....	42.00	43.50	44.87½	33.25
Antimony, Hallett, New York....	8.00	8.12½	8.75	8.00
Tin plate, 100 lb. box, New York	\$3.94	\$3.94	\$3.94	\$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in. inclusive, ¾ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c. net; angles, 3 in.

on one or both legs, less than ¾ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¾ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¾-in. plates. Plates over 72 in. wide must be ordered ¾ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¾ in. to and including 3-16 in. on thin- nest edge, extra.....	.10
Gauges under 3-16 in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates) 3 ft. and over in length.....	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.....	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over
TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 and 14, 1.60c.; Nos. 15 and 16, 1.70c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½ in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	\$2.40	23	\$2.40	\$3.50
28	\$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Butt Weld.		Steel—		Iron—	
	Black.	Galv.	Black.	Galv.	Black.	Galv.
1 to 1½ in.....	75	63	49	43		
¾ in.....	75	63	71	59		
¾ to 1½ in.....	79	69	75	65		
2 to 3 in.....	80	70	76	66		
Lap Weld.						
2 in.....	76	66	72	62		
2½ to 4 in.....	78	67	74	64		
4½ to 6 in.....	77	67	73	63		
7 to 12 in.....	75	59	71	55		
13 to 15 in.....	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.						
½, ¾, 1 in.....	69	59	65	55		
1½ in.....	74	68	70	64		
¾ to 1½ in.....	78	72	74	68		
2 to 3 in.....	79	73	75	69		

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Lap Weld, extra strong, plain ends, card weight.			
2 in.....	75	69	71
2½ to 4 in.....	77	71	73
4½ to 6 in.....	76	70	72
7 to 8 in.....	69	59	65
9 to 12 in.....	64	54	60
Butt Weld, double extra strong, plain ends, card weight.			
½ in.....	64	58	60
¾ to 1½ in.....	67	61	63
2 to 3 in.....	69	63	65
Lap Weld, double extra strong, plain ends, card weight.			
2 in.....	65	59	61
2½ to 4 in.....	67	61	63
4½ to 6 in.....	66	60	62
7 to 8 in.....	59	49	62

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in.....Lap Weld

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.....	65
2½ in.....	67½
2¾ to 3¼ in.....	70
3½ to 4½ in.....	72½
5 to 6 in.....	65
7 to 13 in.....	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, \$27. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, \$1.50; galvanized, \$1.80. Carload lots, to retailers, annealed, \$1.55; galvanized, \$1.85. Galvanized barb wire, to jobbers, \$2; painted, \$1.70. Wire nails, to jobbers, \$1.70.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.									
No.	0 to 9	10	11	12 & 12½	13	14	15	16	
Annealed	\$1.65	\$1.70	\$1.75	\$1.80	\$1.90	\$2.00	\$2.10	\$2.20	
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80	

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser.....	.80
10 to 18.....	.80 and 10
19 to 26.....	.80 and 10 and 2½
27 to 36.....	.80 and 5
Galvanized:	
9 and coarser.....	.75 and 10
10 to 16.....	.75 and 10
17 to 26.....	.72½ and 10
27 to 36.....	.72½
Coppered or Liquor Finished:	
9 and coarser.....	.75 and 10
10 to 16.....	.75 and 10
17 to 26.....	.70 and 10 and 5
Tinned:	
6 to 18.....	.75 and 10 and 10

Pittsburgh

PITTSBURGH, July 19, 1911.—(By Telephone.)

Pig Iron.—It is understood that the Republic Iron & Steel Company has closed an exchange deal with the Struthers Furnace Company by which it buys 60,000 tons of basic iron, delivery being 6000 tons per month up to May 1 next, and gives ore in part payment, there being two tons of ore per ton of pig iron. The pig iron and ore figure in the transaction at practically current market prices for the deliveries involved. Late last week the same buyer obtained 2000 tons of prompt basic at \$13, Valley furnace, giving some ore in partial exchange. Sales of about 4000 tons of basic iron were made last week to two steel works on the Allegheny River at \$12.75 to \$13, Valley. The market is now firmer, and it is doubtful whether \$13 can be shaded, even for early delivery, while for the remainder of the year \$13.25 is demanded. Sales of foundry iron have been heavy in the past fortnight, aggregating about 50,000 tons in this territory, nearly all being sold at \$13.50 at furnace for early delivery, the remainder being for extended delivery at slightly higher figures. A considerable portion of the iron sold at \$13.50 was by furnace interests having freight rates of 75c. to 85c. into Pittsburgh. A sale of 1200 tons of malleable is reported for delivery over the remainder of the year at \$13.25, Valley; silicon being 1¼ to 1¾, and manganese 1½ to 1¾ per cent. We quote as follows: Bessemer, \$15; basic, \$13 for early delivery, and \$13.25 for extended delivery; No. 2 foundry, \$13.50 to \$13.75; malleable, \$13.25 to \$13.50; gray forge, \$13, all at Valley furnace, the freight rate to Pittsburgh being 90c. per ton.

Steel.—New buying of steel is very light, but specifications on sheet bar contracts continue good. Spec-

ifications on billet contracts are picking up, and prices continue firm. We quote Bessemer and open-hearth billets, 4 x 4 in., and up to but not including 10 x 10 in., \$21, base, and sheet and tin bars in 30-ft. lengths, \$22; 1½-in. billets, \$22; forging billets, \$26, base, usual extras for sizes and carbons—all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

(By Mail.)

Business in finished steel products this week is of about the same volume as last, perhaps a trifle better than toward the close of last week, and is keeping the steel mills operating on an average of between 60 and 65 per cent. of full capacity. Operations are dependent chiefly upon orders received from day to day, since as regards the bulk of the business it is only a very short time from the entering of an order until it is put on the mill books and rolled. The most active line in the list is probably sheets, the quietest being wire products, in which the market stands between seasons. About three-fourths the total number of sheet mills in the country are in operation, and nearly as large a proportion of the tin mills, while merchant bars come next in point of activity, pipe and wire being the lowest, with plates, shapes and rails falling between. On all hands the opinion is expressed that the fall trade will be good, a marked improvement being expected to start within the next few weeks. In some cases this opinion is being backed up by action, as there has been heavier buying of pig iron, a considerably larger total tonnage changing hands than is regularly reported in the market. Scrap, also, has taken a turn and dealers have been bidding higher prices for material although thus far it is not apparent that mills are buying more freely or offering higher figures. The awards of the Pennsylvania Railroad late last week went at higher prices than formerly, and at prices above those currently quoted in the trade, since bids at those figures failed to secure any material.

Ferromanganese.—The market continues quiet, with prices unchanged. We quote prompt and forward at \$36.50, Baltimore, freight to Pittsburgh being \$1.95.

Ferrosilicon.—No important sales are reported. We quote 50 per cent. at \$51.50 to \$52, Pittsburgh, for delivery over the second half of the year; 10 per cent. blast furnace ferrosilicon, \$22; 11 per cent., \$24 and 12 per cent. \$25, f.o.b. cars, Ashland and Jisco furnaces.

Muck Bar.—There is no change in the position of muck bar, which can be quoted at \$28.50 to \$29 for best grades of all-pig bar, delivered Pittsburgh.

Skelp.—The skelp market continues quiet, as the pipe mills are doing less than formerly. Prices, however, are unchanged, and we quote grooved steel skelp, 1.25c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.50c. to 1.60c. and sheared iron skelp, 1.70c. to 1.75c., usual terms, all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—Consumers are well covered by regular contracts, on which they are taking only moderate deliveries. We quote Bessemer, open-hearth and chain rods at \$27, Pittsburgh.

Steel Rails.—The local rail mill is running at about the same rate as formerly, chiefly on old specifications. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c. and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Structural Material.—Local structural interests have booked a few thousand tons of fabricated material in the past week, no large jobs being up. Structural mills are running fairly well, as the structural shops are operating at nearly full capacity, and close to their best rate for the year. We quote beams and channels up to 15-in. at 1.35c., Pittsburgh.

Plates.—Plate mills are operating on slightly reduced schedules this week, specifications being lighter. While a large volume of car inquiry is in the market, calling for nearly 15,000 cars in the aggregate, orders are being placed very slowly. This is probably on account of its being the vacation season, and a good lot of car business is fully expected to be closed before September 1. We quote plates, ¼-in. and heavier, at 1.35c., Pittsburgh.

Sheets.—The demand for sheets continues to be better than for most other finished steel products, and the sheet mills are operating on an average of 70 to

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75 per cent. of the entire capacity. Buying is chiefly for early delivery, although occasionally contracts are made for two or three months ahead. Several plants which were closed for the first week or fortnight of July have resumed operations. Prices as given on a previous page are being strictly maintained, except that it is reported that occasionally some Ohio mills are basing prices at their mills, for Western shipment, instead of on Pittsburgh.

Tin Plates.—The McKeesport Tin Plate Company, which operates the largest single independent plant, started its 22 mills at McKeesport in full this week, after a fortnight's idleness for needed repairs. About two-thirds of the mills of the leading interest and independents are in operation. New buying is light and specifications are only of moderate volume, so that there is likelihood of slightly decreased operations next month. The market is firmly maintained on the basis of \$3.70, Pittsburgh, for 100-lb. coke plates.

Bars.—New buying of bars is light, as the agricultural implement interests have placed practically all their contracts, although thus far their specifications have been light. The steel bar mills are running at an average of 50 to 60 per cent. of capacity, although a few are doing better than this. Most of the iron mills which closed July 1 for repairs are operating again, although not at full capacity. We quote steel bars at 1.25c. and iron bars at 1.25c. to 1.30c., Pittsburgh.

Merchant Pipe.—The demand for merchant pipe from jobbers is very light and is confined to orders needed to make up stocks, which are kept down to the lowest notch. There is very little inquiry for line pipe and the mills are running at less than half capacity in this branch. Regular discounts in effect on iron and steel pipe are given on a previous page.

Rivets.—The market on rivets is fairly active, but not as active as it was in June. We quote structural rivets at 1.70c. to 1.75c., and boiler rivets at 1.80c. to 1.85c., these prices being shaded only on the most desirable orders.

Wire Products.—Orders for wire products are very light, as it is between seasons in the wire trade. Manufacturers using wire are specifying about the same as formerly on their regular contracts, while specifications from jobbers for nails and other wire products are light, with very little contracting. The regular fall trade is expected to open up about the middle of next month. Prices are being well maintained, and we continue to quote: Galvanized barb wire, \$2 per 100 lb.; painted, \$1.70; annealed fence wire, \$1.50; galvanized, \$1.80; wire nails, \$1.70 and cut nails, \$1.60, f.o.b. Pittsburgh, full freight added to point of delivery.

Shafting.—Buying of shafting continues to be of a hand to mouth character, and regular prices continue to be shaded somewhat on particularly desirable business. We quote regular discounts at 60 per cent. off in carload lots and 55 per cent. in less than carloads, delivered in base territory.

Spelter.—The market is quieter this week, there being few inquiries in local territory, and hardly any sales. Producers are fairly well sold up and are a trifle firmer in their views, although the market is hardly quotable at a higher price. We quote prime western grades at 5.67½c. to 5.70c., delivered Pittsburgh, freight from East St. Louis being 12½c.

Hoops and Bands.—Specifications on hoop contracts are fairly good, this being usually an active season. New buying is relatively light. We continue to quote: Hoops, 1.40c.; bands, 1.25c., extras on the latter as per the steel bar card.

Merchant Steel.—There is no change in the rate of buying, which is moderately good. Regular prices, which, however, are being shaded, are: Iron finished tire, ½ x ½-in., and heavier, 1.40c., base; under these sizes, 1.55c.; plain shed tire, 1.60c.; channel tire, 1.80c. base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Boiler Tubes.—The boiler tube market continues in an unsatisfactory condition, the demand being light, while the mills continue to shade the regular discounts, which have been nominal for a long time.

Iron and Steel Scrap.—The dealers a few days ago suddenly started to bid higher prices for material, evidently expecting the mills to take a great deal more scrap within the next month or two, although thus

far the mills are not buying at any better rate than formerly, and are not bidding any higher prices. The Pennsylvania Railroad scrap lists, which were awarded last week, went at higher prices than the previous lists, and dealers bidding the open market quotations got hardly any material. We revise prices on many of the leading lines, and now quote as follows, per gross ton, f.o.b. Pittsburgh:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	\$13.00 to \$13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.00 to 11.25
Rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.75 to 14.00
No. 1 railroad malleable stock	12.50 to 12.75
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	23.00 to 23.50
Steel car axles	18.00 to 18.50
Locomotive axles	22.00 to 23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
Cast iron borings	8.75 to 9.00
Machine shop turnings	9.00 to 9.25
Old iron rails	15.00 to 15.25
No. 1 wrought scrap	14.25 to 14.50
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Coke.—The demand for prompt coke has been very light and prices have sagged off somewhat. There is no demand for contract furnace coke at the prices asked, consumers who were anxious to be covered having already placed contracts, and fresh demand depends on furnaces now idle blowing in. Most of the contract foundry coke has been placed for the twelve-month beginning July 1, but a few contracts expire July 31, and inquiry against such requirements is beginning to appear. We quote standard grades of furnace coke for prompt shipment at \$1.40 to \$1.50, and on contract over the last five months of the year at \$1.65 to \$1.75, with 72-hr. foundry coke for prompt shipment at \$1.85 to \$2 and for contract at \$2 to \$2.25, all per net ton at ovens. The output of coke last week in the Connellsville and lower Connellsville regions was 267,122 tons, a decrease of 9000 tons, shipments being 7646 cars, a decrease of 800 cars.

Chicago

CHICAGO, July 19, 1911.—(By Telegraph.)

Pig Iron.—The very low price of pig iron continues to be responsible for the buying of a moderate volume for delivery in the last half. Except in comparatively few instances where melters have permitted their stock to run very low and now require immediate shipment of a car or two to cover their ordinary needs, purchases reflect the volume of hoped for business rather than the tonnage of business now on the books. Producing capacity has been greatly reduced and current sales are sufficient in volume to reduce somewhat the stocks of iron on furnace yards. Progress in this direction is tending to make the furnace position firmer as to prices, and as long as this ratio continues it will, of course, be possible to maintain the present quotations. The weakness in the situation lies behind the fact that the movement which is reducing the furnace stock piles is simply increasing the melters' supply. The hope for a stronger market depends upon an increase in melting orders in the next 60 days, derived from business not now in sight. Southern No. 2 iron can still be bought on the basis of \$10, Birmingham, for last half delivery, but where at least a part of the iron cannot be taken for prompt shipment an advance of 25 cents per ton is asked. Local irons are held nominally at \$15, f.o.b. furnace. We quote for Chicago delivery, except on local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	\$16.50 to \$17.00
Northern coke foundry, No. 1	15.50
Northern coke foundry, No. 2	15.00
Northern coke foundry, No. 3	14.75
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent.	17.90
Jackson Co. and Kentucky silvery, 8 per cent.	18.90
Jackson Co. and Kentucky silvery, 10 per cent.	19.90

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(By Mail.)

Standing out above the general situation, in which improvement has just about held its own during the past week, the tonnage booked by the local office of the Steel Corporation was distinctly a feature. Approximately 100,000 tons of prompt shipment orders were placed on the books, which is about 100 per cent. over the normal weekly tonnage. The greater portion of this business consisted of rails and track fastenings, but the volume of structural shapes, bars and plates also showed increases. As compared with May, the month of June was reported by the leading interest as showing an increase of 50 per cent., while July thus far is making a better showing than June. An Atchison, Topeka & Santa Fe railroad bridge requiring 9910 tons and a building for the Chicago Telephone Company requiring 5085 tons were the principal orders for fabricated steel. From the standpoint of tonnage the general business in finished products is apparently reasonably good. The same cannot be said of prices, from the standpoint of the producer, particularly with regard to sheets and bar iron, and the demand for material is not sufficiently insistent to warrant any present hopes for improvement in this direction. The position of the dealer in old materials is also an unprofitable one at present prices. For pig iron still lower prices are rumored from the South.

Rails and Track Supplies.—As suggested in this report a week ago, orders for a large tonnage of rails were pending. It is now reported by the Illinois Steel Company that its rail bookings of last week totaled a very handsome figure. Liberal specifications for track fastenings were also received. To what extent domestic railroads figured in the above tonnage is not known. The demand for light rails is meager. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Approximately 16,000 tons of steel will be required for fabrication to fill contracts placed during the past week. Of this total the major portion will go into the Sibley bridge over the Missouri River for the Atchison, Topeka & Santa Fe Railroad, which calls for 9910 tons, and into the Chicago Telephone Company's building at Chicago, which will take 5085 tons. The American Bridge Company will fill both of these contracts. This company will also furnish 110 tons for two spans for the Utah Light & Railway Company at Salt Lake City and 195 tons for nine transmission towers for the Southern California Edison Company. The King Bridge Company, Cleveland, will furnish 130 tons of bridge work for the Missouri, Kansas & Texas; Lowth Bros. Iron Works, 155 tons for St. Joseph's Hospital, Denver; the Hubbard Company, 185 tons for transmission poles for the Olympic Power Company, Port Angeles, Wash. The Great Northern also ordered 205 tons of girder spans. The 450 steel underframe cars placed with the Western Car & Foundry Company by the Ann Arbor Railroad will also bring corresponding orders into this market. The mill orders for the week held up very well. We quote plain material from mill at 1.53c. to 1.58c. and from store 1.75c., Chicago.

Plates.—Miscellaneous orders from Western roads for all steel baggage and railroad mail cars have brought all of the local car builders into the market for at least a limited quantity of plates. The Proctor & Gamble Company is inquiring for 100 tank cars. Augmented by a moderate tonnage of tank plate the aggregate plate business continues fairly good. Chicago quotations for mill shipment are 1.53c. to 1.58c. and from jobbers' stocks, 1.75c.

Sheets.—While the volume of sheet business continues to be maintained the dissatisfaction with existing prices offsets somewhat the better feeling which the improved tonnage might otherwise engender. The Indiana Harbor mill is running full on sheets, but some of the mills that buy sheet bars do not find the present situation very profitable. Chicago prices on sheets are as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. An error was made in quoting galvanized sheets last week, the correct price now being given. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00c. to 2.10c.; No. 28 black, 2.60c. to 2.70c.; No. 28 galvanized, 3.35c. to 3.45c.

Bars.—The leading interest reports the closing of more steel bar tonnage. There can no longer be any question but that the implement interests have closed for practically their entire quota. Conflicting opinions as to the firmness of the 1.25c. Pittsburgh price are noted, but it is not believed that shading of this price goes beyond small concessions for desirable and immediate delivery business. The activity in bar iron has moderated and bar iron mills generally are disappointed because of the low prices existing. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Manufacturers of fencing are showing a disposition to contract for fall delivery and generally those grades of wire for manufacturing requirements show more activity than country wire. Nails also indicate a limited demand. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c.; all Chicago.

Cast Iron Pipe.—The pipe market has been supported by the large number of inquiries for municipal water systems from the smaller towns. Miscellaneous orders are reported as above the average. The United States Cast Iron Pipe & Foundry Company reports contracts as follows: Council Bluffs, Ia., 400 tons; Melton, Wis., 500 tons; Milan, Mo., 200 tons; Flora, Ill., 700 tons. The 11,000-ton order at Detroit has not been placed, although it is understood that R. D. Wood & Co., Philadelphia, were the low bidders. In the past the Detroit shop of the American Car & Foundry Company has usually been the successful bidder for this business. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$25.50; 6 to 12 in., \$24.50; 16 in. and up, \$24, with \$1 extra for gas pipe.

Old Material.—A very quiet week, with no change in the price level, seems to have been the situation with regard to scrap. The Chicago & Alton sold its reolling rails at a delivered price between \$12.50 and \$13. This consignment will probably be applied against old orders, of which there are still some in the market at \$13, for it is unlikely that consumers would pay over \$12.50 for reolling rails at this time. Transactions during the week in No. 1 wrought at prices as high as \$11.40 per ton were of the same character; several hundred tons of this grade were bought by a consumer at \$11.25, delivered, but this buying probably exhausted the current demand at that price. The Baltimore & Ohio Railroad sold the material offered on its recent list, only a small part of it coming to this market. We quote below for delivery to buyer's works, all freight and transfer charges paid, per gross ton:

Old iron rails	\$14.00 to \$14.50
Old steel rails, reolling	12.25 to 12.50
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.00 to 10.50
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	\$12.50 to \$13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.50 to 10.75
Steel knuckles and couplers	9.25 to 9.75
Locomotive tires, smooth	16.00 to 16.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, July 18, 1911.

A comparatively good volume of business, considering the season, continues to come out. The stronger undertone recently noticeable in the general market appears to be gradually increasing. In the pig iron market the most pronounced movement has been in the low grades, although a very fair amount of business is being done in the higher grades and the trade

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is encouraged with the situation. In finished material better specifications are coming out. Structural steel work continues the most active. More business has been placed for billets, while sheets are also in good demand. Iron bars still remain quiet. Old material shows an advancing tendency, not so much the result of actual transactions, but from the fact that bidders failed to get scrap from the railroads at prices recently prevailing. In instances consumers are offering slightly better prices for some grades of material.

Iron Ore.—The movement has been light. Negotiations are still pending for cargo lots of foreign ore, and an inquiry for a moderate amount of lake ore is reported. Importations in the week ended July 15 include 15,318 tons of Spanish, 7740 tons of Newfoundland and 4900 tons of Cuban ore.

Pig Iron.—Conditions are reported to be gradually assuming better shape. Stocks on furnace banks in this district are comparatively low and sellers' order books are in more satisfactory shape. In instances sellers express the opinion that they have practically all the business they want at low prices and show less disposition to urge purchases. At the same time consumers feel that the market is at the bottom and would buy for fourth quarter or more extended shipment, and, while business for the former delivery has been done, no one is apparently willing to sell at present prices for delivery beyond the year end. In a number of instances consumers of foundry grades are urging deliveries on iron already contracted for, which is taken as an indication of small stocks in melters' hands and promises a more active movement, particularly in small lot buying. The most pronounced movement has been in low grade iron. One Delaware River pipe foundry has contracted for upward of 5000 tons of Northern iron, while another has taken 3000 tons of Southern forge, the price for which is reported to have been \$9.50, Birmingham. Several moderate sales of Virginia low grade, to pipe makers in that district, are also reported. One Delaware River pipe foundry is said to be still in the market for a block of 6000 tons. A machinery builder has purchased 5000 tons of No. 2 plain iron, for last half delivery, and is said to be in the market for another block of the same size. Tenders for 1500 tons, part No. 2 X and part No. 3 foundry, for the Lackawanna Railroad, delivered at Scranton during the next four months, go in to-day. Inquiry for several moderate lots of malleable foundry and charcoal iron is reported. A very fair moderate lot business in standard brands of No. 2 X and No. 2 plain foundry grades, for third quarter shipment, continues to be done. Outside of the transactions in low grade iron little has been done in Southern iron in this district. Virginia foundry grades have been sold in small and moderate lots, few exceeding 100 tons, principally for third quarter shipment, at unchanged prices. Lower quotations for special analysis iron are still being talked of. Forge iron still remains inactive, a nominal quotation being about \$14, Eastern furnace. Less activity is noted in the steel making grades. No further sales of basic have been reported, although one melter in this district is still in the market for a lot of 5000 tons. Producers are, as a rule, pretty well sold up for near future delivery and refuse to consider less than \$14, furnace, for this grade. Small sales of standard low phosphorus iron continue to be made at unchanged prices. The general range of prices is unchanged, quotations for standard brands, delivered in buyers' yards, in this vicinity, ranging as follows:

Eastern Pennsylvania No. 2 X foundry.....	\$15.00 to \$15.25
Eastern Pennsylvania No. 2 plain.....	14.75 to 15.00
Virginia foundry	15.05 to 15.50
Gray forge	14.50
Basic	14.25 to 15.00
Standard low phosphorus	20.50 to 20.75

Ferromanganese.—Inquiry for several moderate lots for Western shipment are reported, but the demand in this district continues at a standstill. Prices are nominally quoted at \$36.50, Baltimore.

Billets.—A somewhat better inquiry is reported, with consumers more inclined to purchase for forward delivery. Orders for early shipment are running larger and a sale of 1000 tons of rolling billets for three months' delivery, at market quotations, is reported. Forging steel is in better demand, but no large sales have been made. Quotations are well maintained, open hearth rolling billets commanding \$23.40 and ordinary forging billets \$28.40, delivered in this vicinity.

Plates.—Business has been closely confined to small and moderate lot orders. In the aggregate, however,

the volume has been up to the recent average and mills continue to operate on an even basis. Plates for structural work have been in the most active demand, with a fair run of business in locomotive, tank and boiler plates. Prices are unchanged at 1.50c., delivered here, for ordinary plates.

Structural Material.—The bulk of the business closed here has been confined to small lots, although contracts have been closed for several fair sized buildings and bridge work in other districts. The Cambria Steel Company has the contract for the Scranton aqueduct, requiring about 1600 tons. Fabricators are figuring on several good jobs in the South, including the structural work for the First National Bank Building in Richmond, Va. Bids are being asked for the Ritz-Carlton Hotel in this city, which, it is said, will likely go to the leading interest. A comparatively good business has been done in plain shapes, prices for which are firm at 1.50c., delivered here.

Sheets.—A very satisfactory volume of business continues to be taken by the Eastern mills. While the general run of orders continues small and for early delivery occasional bookings of larger size are reported and the trade feels more encouraged with the outlook for future business. Quotations are well maintained, the following range of prices being named, f.o.b. Eastern maker's mill: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 to 26, 2.50c.; No. 27, 2.60c.; No. 28, 2.80c.

Bars.—The demand for refined iron bars continues irregular and is usually for small lots. For business of an ordinary character 1.20c. mill is still the ruling quotation. Reports of price concessions for steel bars do not appear to be trustworthy, as investigations have not confirmed the rumors. Sellers in this territory continue to take a fair volume of business at the 1.25c., Pittsburgh, base. For delivery in this vicinity refined iron bars are quoted at 1.27½c. to 1.32½c., and steel bars at 1.40c.

Coke.—Moderate activity in foundry coke continues to be reported. Sales in lots ranging from 500 to 1500 tons for forward delivery have been made at prices varying from \$2 to \$2.35 at oven, depending on the grade. For prompt coke \$1.90 has been done. Inquiries for furnace coke for extended delivery, which have been before the trade for several weeks, are slow in closing. Transactions in prompt furnace coke at \$1.40 at oven are reported, but for extended delivery prices range from \$1.50 to \$1.65. The following range of prices per net ton is named for deliveries in buyers' yards in this district, shipment extending over the balance of the year:

Connellsville furnace coke	\$3.65 to \$3.90
Foundry coke	4.15 to 4.60
Mountain furnace coke.....	3.25 to 3.50
Foundry coke	3.75 to 4.20

Old Material.—The market has a stronger tone and in instances prices show an upward movement, due in a measure to the fact that recent bids against railroad lists at about current prices failed to get any tonnage. At the same time some consumers, as well as merchants, are offering a trifle better prices than have been reported. Strictly No. 1 heavy melting steel commands from \$13.25 to \$13.50, and some sellers have even higher ideas as to prices. Yard steel is still available, however, at \$13, but is frequently subject to rejection after inspection by the buyer. Higher prices are also being bid for some of the special grades of old material. Wrought iron pipe is slightly higher on better bids by consumers; wrought turnings, cast borings and stove plate also show an advance, due to the same cause. Scrap merchants are very much encouraged with the outlook and are disinclined to make sales in any quantity under present market conditions. The following quotations, while still to a certain extent nominal, represent about the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia varying from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel scrap.....	\$13.25 to \$13.75
Old steel rails, rerolling (nominal).....	14.00 to 14.50
Low phosphorus heavy melting steel scrap..	16.75 to 17.25
Old steel axles (nominal).....	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	17.50 to 18.00
Old car wheels	13.00 to 13.50
No. 1 railroad wrought.....	15.00 to 15.50
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.00 to 11.50
No. 2 light iron (nominal).....	6.75 to 7.25
Wrought turnings	9.00 to 9.50
Cast borings	8.75 to 9.25
Machinery cast	13.00 to 13.50
Railroad malleable (nominal).....	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

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Cleveland

CLEVELAND, OHIO, July 18, 1911.

Iron Ore.—A round tonnage of non-Bessemer ore was sold in one lot by a local ore firm during the week, this being the first sale of any size for some time. A few small lots were also sold. The general feeling in the ore trade shows an improvement. While sellers expect the next few weeks to be quiet they are looking for a fair volume of business about the first of September. Shipments this month are expected to show some improvement over June. A large percentage of the ore now being shipped is being stored on the docks. We quote prices as follows: Old range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; old range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

Pig Iron.—Conditions are slightly more in favor of sellers. One selling agency reports one sale of a round tonnage of foundry iron for the last half delivery and several other inquiries for good-sized lots have come out. A number of sales of lots of 500 tons and under are also reported. Little demand has developed as yet in this immediate territory. The sentiment among producers has improved. While prices are very low it is believed that they have reached the bottom and that with the large number of merchant stacks out of blast it will not take a great amount of activity to make prices a little stiffer. Attempts have been made during the past few days by buyers to obtain foundry iron at \$13.25, Valley furnace, for No. 2 for the last half, but the market appears firm at a minimum price of \$13.50. The general asking price of \$14, delivered Cleveland, quoted by local furnaces can probably be shaded slightly. There is little inquiry for Southern grades. For prompt shipment and for the last half we quote, delivered, Cleveland, as follows:

Bessemer	\$15.90
Basic	\$13.75 to 14.00
Northern foundry, No. 2	13.75 to 14.00
Gray forge	13.25
Southern foundry, No. 2	14.35 to 14.60
Jackson Co. silvery, 8 per cent. silicon	17.50 to 17.75

Coke.—Following the activity in foundry grades a few weeks ago the market is very dull. Many foundries have not yet covered for their last half requirements, but are buying car lots as they need it. There is no demand for furnace coke. We quote standard Connellsville furnace coke at \$1.40 to \$1.50 per net ton at oven for spot shipment, and \$1.60 to \$1.70 for the last half. Connellsville 72-hr. foundry coke is quoted at \$1.75 to \$2.15 for prompt shipment, and \$2.15 to \$2.40 for the last half.

Finished Iron and Steel.—The demand in practically all finished lines shows a further improvement over preceding weeks. Mill agencies are getting a fair volume of small orders from nearly all sources and quite liberal specifications on contracts. Improved conditions are reported by manufacturers in a large number of lines. The steel bar market is firmer, and some consumers who have been holding back in the hope of getting steel at 1.20c. have closed contracts during the week for the remainder of the year at the regular price. While some shading on steel bars is reported, it appears that this price has been made only for round lots for immediate shipment. The demand for structural material is quite active, and liberal specifications have come from fabricators. The American Bridge Company has taken 1700 tons for four bridges for the Detroit, Toledo & Ironton Railroad. Other structural work placed during the week includes 400 tons for an addition to the Colonial Hotel, Cleveland, and 140 tons for an addition to the plant of F. Widlar & Co., Cleveland, both taken by the National Iron & Wire Company, Cleveland, and 125 tons for a building for the Continental Motor Mfg. Company, Detroit, taken by the McClintic-Marshall Construction Company. Bids were received July 18 for about 2000 tons for the new city hall, Cleveland. The Cambria Steel Company has taken orders for 600 tons of standard rails, 500 tons of which are for extensions to be made by the Erie Traction Company, Erie, Pa. The demand for shafting is moderate, and prices are not firm. Sales are reported at 60 and 10 per cent. off. The demand for rivets is more active than for some time, but prices are still low; for desirable orders we quote structural rivets at 1.60c., Pittsburgh, and boiler rivets at 1.70c. There is a fair demand for sheets and considerable contracting is being done for the last half delivery. The demand for iron bars continues very light, prices are unchanged at 1.25c. to 1.30c. at mill. The Union and Empire rolling mills, Cleveland, are

still shut down, and it has not been decided when either will be started up.

Old Material.—The market is generally quiet, but prices are firm. The new inquiry for heavy steel scrap noted last week has resulted in very little business, consumers apparently being unwilling to pay the prices asked for future delivery. Dealers declare that they can sell a large tonnage for extended delivery at current prices, but they expect a further advance within the next few weeks and are holding for the advance, so that not much scrap is to be had at present prices. Sales during the week have been limited mostly to small lots on cars. Quotations are unchanged. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	\$13.00 to \$13.50
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.75 to 12.25
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.00
Railroad malleable	11.50 to 12.00
Light bundled sheet scrap	8.50 to 9.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	\$21.00 to \$21.50
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.00 to 8.50
No. 1 busheling	10.00 to 10.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 cast	11.25 to 11.50
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, July 18, 1911.—(By Telegraph.)

Pig Iron.—During the past few days there were fewer requests for prices on round lots of iron as well as on small tonnages. An Illinois consumer is asking for 750 tons each of Southern and Northern foundry and two Michigan melters want 1500 and 2000 tons of either Northern or Southern iron. About 600 tons of Northern No. 2 foundry was sold to a central Ohio consumer at \$13, Ironton, for last half shipment, although a few brands are bringing an advance over this figure, and 700 tons of No. 2 foundry went to an Indiana manufacturer at \$13.25 at furnace for the same delivery. Southern iron sales include 1300 tons of No. 2 foundry and 1000 tons of No. 4 foundry for shipment to Iowa on the basis of \$10, Birmingham, for No. 2 foundry. Malleable is in better demand and a sale of 1800 tons for shipment to Indiana was made this week. Malleable is quoted around \$13.25 to \$13.50, Ironton. Several inquiries for malleable are outstanding that are expected to be closed shortly. There is no activity in basic but any indication of a change would doubtless awaken consumers in this district. Southern basic is quotable around \$10, Birmingham, for delivery throughout the year. Based on freight rates at \$3.25 from Birmingham and \$1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft ..	\$13.75 to \$14.00
Southern coke, No. 2 foundry and 2 soft ..	13.25 to 13.50
Southern coke, No. 3, foundry	12.75 to 13.00
Southern coke, No. 4 foundry	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.45 to 14.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—A southern Ohio furnace is understood to have closed for 7500 to 10,000 tons of Pocahontas 48-hr. coke, for delivery throughout the next 12 months. With this exception there has been no activity in either furnace or foundry grades. Inquiries are very scarce, and the output in all districts is being curtailed. Prompt shipment furnace coke is obtainable around \$1.40 to \$1.50 per net ton at oven, and between \$1.50 and \$1.65 on contracts. Foundry coke remains at about \$2 for prompt shipment, with future delivery quotations ranging from \$2.10 to \$2.35 per net ton at oven. The above prices are quoted in the Pocahontas, Wise County and Connellsville fields.

Finished Material.—Neither orders nor inquiries are coming quite so freely, but this cessation is probably due to the usual holiday and stock-taking period. Jobbers have also been quietly specifying to cover future requirements, and a number in this territory

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have about all the stock on hand and contracted for that they need to carry them through the next few months. Any change for the better in the business situation would doubtless bring these same merchants into the market as heavier purchasers, and it is believed that prices on all kinds of finished material have reached bottom. Steel bars are quoted from warehouse stock at 1.70c., and structural material at 1.80c. Mill agencies are holding firm to the regular Pittsburgh prices on car-load shipments of all finished iron and steel products.

Old Material.—The demand for scrap of all kinds is limited, and there has been a softening in prices on a few grades. However, dealers expect a change for the better within the next 30 days, as by that time the rolling mills in this section will be in full operation again. The foundry business is also expected to show some improvement soon, as it has been rather limited for some time. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton.....	\$10.50 to \$11.00
Casting borings, net ton.....	4.50 to 5.00
Steel turnings, net ton.....	5.50 to 6.00
No. 1 cast scrap, net ton.....	9.50 to 10.00
Burnt scrap, net ton.....	6.50 to 7.00
Old iron axles, net ton.....	16.50 to 17.00
Bundled sheet scrap, gross ton.....	7.25 to 8.25
Old iron rails, gross ton.....	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton.....	21.00 to 22.00
Old car wheels, gross ton.....	10.25 to 11.00
Heavy melting steel scrap, gross ton.....	10.00 to 10.50

St. Louis

ST. LOUIS, Mo., July 17, 1911.

The iron and steel market here continues to show improvement, the average of recent times having been approached more closely. Business for the first half of July is reported better in practically all quarters, while some houses assert that the business booked the first 15 days of the month equals that of the entire month of June. There has been a stiffening of prices in most quarters, but with some sales the past week for immediate shipment at concessions from the quoted figures. Inquiries continue to increase and the tonnage movement is very good as compared with the recent past, but, of course, it is not yet anywhere near capacity. The improvement applies to both the raw and the finished product.

Pig Iron.—The pig iron market has stiffened materially and with less comment as to \$10 iron. Several of the larger producers for this territory are reported as having even placed their prices for No. 2 Southern iron as high as \$11, but this is regarded largely as an announcement that they have taken all the business that they care to at and below \$10.50, rather than that the market is on an \$11 basis. The sales made during the week were nearly all on an immediate shipment basis and included lots of 200 tons, 500 tons and 1000 tons, the last being for Southern high manganese. On all these the prices were off from the quotable figure. Nothing new transpired in Northern, basic, malleable or other irons. On contracts the requisitions during the week have kept shipments well up in tonnage and out of this comes encouragement to the dealers that the consumers are keeping close up with the situation.

Coke.—The better feeling with relation to coke which was noted last week continues and the prices to-day are fully as stiff at the figures given as they were. The growing number of inquiries for last half and for full year delivery—to July, 1912—demonstrates increasing interest and the probability of larger demand on new business. Specifications on contracts are up to the mark, with practically no delinquencies, some even anticipating their quantities. The price of last half delivery, Connellsville, continues around \$2.25 to \$2.35, with prompt shipment coke at \$1.90 to \$2. The aggregate of tonnage still shows better than for any preceding period since last winter and the dealers generally believe that the increase will continue.

Finished Iron and Steel.—The business for the week in finished products has shown up much better than for a long time and in addition to the improvement noted indications are for the development of some good sales within the next week or 10 days. One sale of standard steel rails closed in the week was for about 700 tons for a Kansas City line. Several other inquiries are in the market, none very large, but with an aggregate amounting to a good bit of business. If light rails the coal mining companies increased their demand in the week, the improvements at the mines developing as the necessities for fall and winter work make themselves apparent. The inquiries from the

lumber roads are better, but not much is expected from this direction for the present. In structural steel the orders during the week have been very good, but most of the tonnage has been specified for quick shipment. It is anticipated that the fabricators will begin to order for stock very soon. In plates the only business for the week, and the first for some time, was an order for 450 tons, which will be used for the construction of government barges. In the present quiet state of the plate market quotations are on a basis of about \$1.30 Pittsburgh. In bars some tonnage is moving, but the aggregate is not heavy. This continues to be largely due to the low price of iron, which effects quite a differential in favor of the latter. Track fastenings have been quiet. A promising indication in the market has been the inquiries of a car company for figures in the preparation of estimates for an order of 3000 steel cars for the Illinois Central road. Estimates are also being prepared for several smaller orders from other roads, but the outcome is not yet definitely indicated in these.

Old Material.—The dullness of the scrap market continues, with little to be said beyond an anticipation of better things by the first of the month. Dealers are buying on a speculative basis, believing that the material is worth holding at present figures. The market tone reflects the feeling of the new material situation rather than any inherent condition of its own. Dealers' prices per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	\$12.50 to \$13.00
Old steel rails, rerolling.....	11.25 to 11.75
Old steel rails, less than 3 ft.....	10.25 to 10.75
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap.....	10.25 to 10.75
Frogs, switches and guards cut apart.....	10.25 to 10.75

The following are quotations per net ton:

Iron fish plates	\$11.00 to \$11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought.....	10.75 to 11.25
No. 2 railroad wrought.....	9.75 to 10.25
Railway springs	9.00 to 9.50
Locomotive tires, smooth.....	14.50 to 15.00
No. 1 dealers' forge.....	8.50 to 9.00
Mixed borings	5.00 to 5.50
No. 1 busheling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings.....	8.00 to 8.50
No. 1 cast scrap.....	10.00 to 10.50
Stove plate and light cast scrap.....	8.00 to 8.50
Railroad malleable	8.00 to 8.50
Agricultural malleable	7.00 to 7.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap.....	7.25 to 7.75
Railroad grate bars.....	8.00 to 8.50
Machine shop turnings.....	6.50 to 7.00

Buffalo

BUFFALO, N. Y., July 18, 1911.

Pig Iron.—The firming up of prices by producers has apparently checked interest in the market on the part of consumers and inquiries and orders have fallen off noticeably in the week as compared with the previous two weeks. Inquiries under negotiation in the week aggregate only about 3000 tons, including a small amount of malleable, and the total tonnage reported booked is under 5000 tons, composed chiefly of small lots. Most furnaces in this district have advanced asking prices 25 to 50c. per ton from the recent low schedules and are not making special effort to secure business. They have sufficient orders on their books to take care of their output for the current quarter and \$13 iron seems to be no longer obtainable. We quote as follows, f.o.b. Buffalo, for last half delivery:

No. 1 X foundry.....	\$13.75 to \$14.25
No. 2 X foundry.....	13.50 to 14.00
No. 2 plain.....	13.25 to 13.75
No. 3 foundry.....	13.25 to 13.50
Gray forge	13.25 to 13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Finished Iron and Steel.—Business in most lines of finished products is coming forward in good volume, taking into consideration that this is the usual period of midsummer quiet. Considerable increase in contracting in bar products and plain structural materials is noted since the cessation of the extremely hot weather, and orders for some good sized tonnages of concrete reinforcing bars have been placed in the week. Most mills are running on an output of about 75 per cent. of capacity and selling agencies report prospects good for a brisk fall trade. In fabricated structural lines a large amount of business is developing, particularly in small and moderate sized building projects. The contract for the fabrication and erection of the

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steel for the new factory building to be erected by the Pfaunder Company, Rochester, N. Y., about 100 tons, was taken by the Lackawanna Bridge Company, of this city, and the American Bridge Company secured the contract for the 1600 tons of steel required for the 16-story office building to be erected by the Eastman Kodak Company, Rochester. The general contract for the new passenger station for the New York Central Railroad at Rochester, requiring a large tonnage of steel, has been let to Gorsline & Swan, of that city. The plans for the steel work for the Buffalo General Electric Company's 17-story office building, Buffalo, are to be slightly revised before bids are taken by the general contractors, Gill & Son, Cleveland. Plans for the Hutchinson High School, Buffalo, which call for 800 tons of steel, are also being revised, the bids having largely exceeded the estimates.

Old Material.—The market is somewhat stronger in tone, with a good demand for almost all classes of material. Prices are firmer, and although consumers demur at paying the advanced figures demanded by dealers material is coming out only at the new prices. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$13.00 to \$13.50
Low phosphorus steel.....	15.50 to 16.00
No. 1 railroad wrought.....	13.50 to 14.00
No. 1 railroad and machinery cast scrap...	13.50 to 14.00
Old steel axles.....	18.50 to 19.00
Old iron axles.....	22.00 to 22.50
Old car wheels.....	13.00 to 13.50
Railroad malleable.....	12.00 to 12.50
Boiler plate.....	11.50 to 12.00
Locomotive grate bars.....	11.00 to 11.50
Pipe.....	9.50 to 9.75
Wrought iron and soft steel turnings.....	7.00 to 7.50
Clean cast borings.....	6.75 to 7.25

Birmingham

BIRMINGHAM, ALA., July 17, 1911.

Pig Iron.—The price of \$10, Birmingham, for No. 2 foundry seems to be applicable to deliveries throughout the remainder of the year, although it is without doubt true that such a price can be obtained from but few makers, and most of these seem to be short on certain grades. There has been more buying than the current reports would indicate. Thus far no sales are reported for deliveries running further ahead than the last quarter of the current year. Prices are quotable as follows, per gross ton, on board cars at furnaces in this immediate district:

No. 1 foundry and No. 1 soft.....	\$10.50
No. 2 foundry and No. 2 soft.....	10.00
No. 3 foundry.....	9.50
No. 4 foundry.....	9.25
Gray forge.....	9.25
Mottled.....	9.00
Standard basic, chill cast.....	10.25
Off basic.....	9.75
Charcoal car wheel iron.....	22.50

Cast Iron Pipe.—Inquiry is good for water mains, and shipments on old contracts continue to move at a fair rate. Prices on this line have not really declined in full sympathy with the reduction in pig iron to the present level. Chief interest here centers now in the final results of the reported deal whereby the largest interest in cast-iron pipe is reported as having taken over the plant of the Dimmick Pipe Company at North Birmingham. This plant is now idle, and there is more or less speculation as to whether or not work will be resumed at an early date. We continue to quote on water pipe as follows, per net ton, f.o.b. cars here: 4 to 6-in., \$22; 8 to 12-in., \$21; over 12-in., average \$20, with \$1 per ton extra for gas pipe. These prices are probably subject to shading for large municipal contracts.

Old Material.—Prices ruling are such as to fail to attract any interest of consequence in any quarter, and it is felt among dealers here that such condition will continue to prevail. No large transactions have taken place in some time, and there is in reality barely sufficient trading taking place to make a market. We continue to quote, nominally, as follows, per gross ton, f.o.b. cars here:

Old iron axles (light).....	\$13.50 to \$14.00
Old steel axles (light).....	12.50 to 13.50
Old iron rails.....	12.50 to 13.00
No. 1 railroad wrought.....	11.00 to 11.50
No. 2 railroad wrought.....	9.50 to 10.00
No. 1 country wrought.....	7.50 to 8.00
No. 2 country wrought.....	7.00 to 7.50
No. 1 machinery.....	9.50 to 10.50
No. 1 steel.....	8.50 to 9.00
Tram car wheels.....	8.00 to 8.50
Standard car wheels.....	9.50 to 10.50
Light cast and stove plate.....	7.00 to 7.50

Coal and Coke.—More interest is felt in the coal trade here this month, as a number of contracts are being renewed; but the prices are materially below the figures that prevailed a year ago. The mines are operating on a much smaller output and conditions are rather unsatisfactory to the operators. Foundry coke is in fair demand. Some contracts have been closed recently for Virginia and West Virginia coke for foundry use, and some business that would ordinarily go to Alabama ovens has been diverted to other fields on account of the change in freight rates in Alabama affecting certain consuming interests materially.

San Francisco

SAN FRANCISCO, CAL., July 12, 1911.

A little better feeling is observed than for some time, though the general movement remains quiet. The tonnage of sales in most departments, in fact, is smaller thus far in July than for the latter part of June and large inquiries of a definite nature are comparatively few. Improvement is noted, however, in general mercantile and industrial business, as well as in building, which is expected to react favorably on the steel trade. Financial conditions, as shown by current bank clearings, are about normal and crops, though below the average, are bringing exceptionally good returns.

Bars.—The principal demand, as for some time past, is for reinforcing bars, for which a number of good-sized orders have recently been placed. While foreign material is used for this purpose to a considerable extent, domestic mills are now getting a fair proportion of the business. Purchases for stock are extremely small, as merchants are still carrying a considerable tonnage of imported bars and the jobbing movement is confined to narrow limits. More inquiry is expected from manufacturing interests in the near future, but the buying from this source so far has been merely for current needs. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—While the official figures show very little increase in the last few months, contractors and architects report more activity than for two years or more. Local fabricating orders for the last fortnight, though hardly as large as for the two weeks previous, include several important jobs and considerable prospective work will soon be ready for figuring. The most important item here is the Masonic Temple, taken by the American Bridge Company. Dyer Bros. have secured the award for cells for the county jail and have booked orders for the Brown building on Sixth street, about 200 tons, and the O'Sullivan building at Fourth and Minna streets. The general situation at Portland, Ore., is rather quiet. The Pacific Rolling Mill Company is erecting a building for the Union Iron Works in this city, and the latter interest will open bids at the end of the week for the general construction of a building requiring about 500 tons, to be used as a shipbuilding structural shop. New bids will be received shortly on the Knights of Columbus building, but the outcome is uncertain. Plans for the Girls' high school, about 1000 tons, will be ready for figuring about the end of the month. The Schrader Iron Works will furnish 157 tons for the Rolkin building in this city. Plans are under way for a large number of Class A buildings in this city, but some time will elapse before most of them are ready to be let. Bids have been taken on a lot of bridge work at Tacoma, Wash., and the Northern Pacific Railway is seeking permission to erect a steel draw over the Lake Washington Canal at Seattle. Bids will be opened July 31 for steel work in the Judiciary building, Honolulu.

Rails.—The Fresno, Hanford & Summit Lake Railroad is reported to have ordered 4500 tons of 70-lb. rails, but no information on the deal is obtainable here. As a rule the prospect of business from new interurban lines is very indefinite, though some of the established roads are coming out for small lots for extension work. There is considerable inquiry in Oregon and Washington both for logging and electric lines, and the larger interests are also working on many new branches in that territory. No active demand is noted for light rails, the movement for the season being below expectations.

Sheets.—The movement shows little variation from the recent average, though somewhat more activity is noted in the leading consuming industries. Some fairly large stocks are held on the coast and neither merchants nor consumers have yet shown any inclination to buy much in advance of current needs.

Mechanical and Civil Engineers,
PITTSBURGH, PA.

THE IRON AND METAL MARKETS

Plates.—Buying is limited almost entirely to immediate requirements, but the demand for tank plates continues fairly active. The outlook for tank construction in the oil fields is better than for some time. San Francisco has rejected the bid of Dyer Bros., the only one received, for the construction of a 500,000-gal. tank for the fire protection system. The Los Angeles Mfg. Company has taken an order for 3½ miles of 16-in. riveted pipe for Corona, Cal.

Merchant Pipe.—The distributive movement through the State, which has been dull all the season, shows no signs of improvement. A few orders of moderate importance have been placed recently by oil and water interests, but competition for all such business is extremely strong, and some shading of prices is reported. Conditions in the oil industry are very unsettled, and the continued accumulation of oil in storage does not encourage new development. A revival in the jobbing trade should occur before the end of September, but merchants are buying very conservatively.

Cast Iron Pipe.—The tonnage of recent orders is hardly as large as for the latter part of June, but is satisfactory for this territory, and there is considerable new business in prospect. The Pacific Gas & Electric Company has placed some substantial orders for interior points, and is still in the market. Aside from this the principal business is in southern California. The city of Los Angeles has placed a new order for about 300 tons. That city has taken over the water companies at Alamitos Beach and Long Beach, and will operate the property as part of the municipal system, installing a number of extensions. The city of Santa Barbara, Cal., has purchased 150 tons of pipe, and the Southern California Edison Company is in the market for a small quantity.

Pig Iron.—Local requirements have not increased materially, and the foundry trade is buying only in small lots, principally for immediate needs. Prices on foreign iron are still more or less unsettled. No. 2 Southern foundry iron is nominally quoted at \$20.

Old Material.—Cast iron scrap remains extremely quiet, with a heavy tonnage accumulating in the hands of dealers, though prices show no further reduction. Wrought scrap is also dull. Consumers of steel melting scrap and rerolling rails are still inclined to hold off, but some good-sized deals are in prospect, and an active movement is expected about the end of the month. Prices show little variation, being quoted as follows: Cast iron scrap, per net ton, \$16; steel melting scrap, per gross ton, \$10.50 to \$11; wrought scrap, per net ton, \$11 to \$15; rerolling rails, per net ton, \$11.

New York

NEW YORK, July 19, 1911.

Pig Iron.—A rather better feeling is observed in pig iron circles. The transactions of the week have not been large, but the volume of business has been quite fair for the season. The stiffening of prices in eastern Pennsylvania and at Buffalo may have caused some buyers to defer intended purchases, but others have paid the rates now asked, thus indicating the growth of a little more confidence. Northern iron at tidewater is quoted as follows: No. 1 foundry, \$15.50 to \$15.75; No. 2 X, \$15 to \$15.25; No. 2 plain, \$14.50 to \$15. Southern No. 1 foundry is quoted at \$14.75 to \$15.25, and No. 2, \$14.25 to \$14.75.

Ferroalloys.—Sellers of ferrosilicon here could dispose of some good-sized quantities if they were willing to meet the prices quoted of late, but they are refusing such business. It is a significant fact that European ferrosilicon cannot be brought to this country and laid down at dock for less than \$58 a ton, and, as the syndicate is in good control of the market there, it is thought in New York that prices will go higher. Accordingly sellers are demanding \$53 a ton for 50 per cent. A good demand for ferromanganese exists, but prices are weak. The usual quotation is \$36.50, Baltimore. Some sellers are demanding a higher price, but they are not getting the business.

Cast Iron Pipe.—Quiet conditions still prevail. A few public lettings are advertised for this territory, but they are usually under 500 tons. Carload lots of 6-in. are quoted at \$21 to \$22 per net ton, tidewater.

Old Material.—Notwithstanding the fact that transactions are light, a more confident tone is observed among some of the leading dealers. They believe that the trade has seen the worst of the depression in old material and that a better demand is to be looked for shortly. The volume of business continues about the same as in recent weeks, but with some consumers

deliveries are being taken a little more freely. Quotations are as follows per gross ton, New York and vicinity:

Old girder and T rails for melting	\$10.75 to \$11.00
Heavy melting steel scrap	10.75 to 11.00
Rerolling rails	20.00 to 21.00
Rerolling rails (nominal)	12.00 to 12.25
Standard hammered iron car axles	21.00 to 21.50
Old steel car axles	16.75 to 17.25
No. 1 railroad wrought	12.75 to 13.25
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	4.25 to 4.75
Cast borings	5.25 to 5.75
Wrought turnings	6.25 to 6.75
Wrought pipe	9.50 to 10.00
Old car wheels	11.00 to 11.50
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.00 to 10.50

Finished Iron and Steel.—Some new offerings of good size structural jobs have been made, as here listed, but not many of the contracts of the spectacular sort have been closed. Renewed charges are in the air of low fabricating prices, but where they were formerly directed against one company in particular they are now laid against another. Business in plates is without feature and mills are probably running about 60 per cent. capacity. In steel bars there is a probability that more business has been taken in recent weeks than is generally believed, with the danger of the late buyers thus overstaying the market. Bar iron suffers most from no dominant price-staying element and contracts are being closed at the low rather than the high quotation. New structural work appearing since last week's report includes 1000 tons for Chesapeake & Ohio bridges; 1000 tons for the Brigham Hospital, Boston; 1200 tons for a high school at Albany, N. Y.; 2800 tons for a bank building, Richmond, Va.; 500 tons for the Times-Dispatch building, Richmond; 300 tons for a warehouse at Coenties slip and Water street, New York, and 1200 tons for the McKeon loft building, West Twenty-fifth street, New York. Bids are now being taken for the 2000 tons of the highway bridge at McElhattan, Pa., for the 3000 tons of the Æolian building, New York, and for the 300 tons for the R. H. MacDonald loft building on Nineteenth street, New York, and Jas. Stewart & Co. are general contractors for the building at the West Point Military Academy, requiring 700 tons of steel. The American Bridge Company has the contract for 1200 tons for the Wilson building, Thirty-third street, New York; the Pennsylvania Steel Company has 1100 tons for the Ontario & Western bridge at Hancock, N. Y., 900 tons for pier work for the Boston & Albany and 200 tons for a bascule bridge, Charles River, for Boston elevated system; and Jones & Laughlin Steel Company has contracts as follows: 400 tons, Poli theater, New Haven; 150 tons, Pennsylvania passenger station, Newark, N. J., and 500 tons for the Presser office building, Philadelphia. The Hecla Iron Works is credited 200 tons for work for the post office building at the Pennsylvania station, New York. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.41c. to 1.46c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Metal Market

NEW YORK, July 19, 1911.

The Week's Prices

		Copper, New York				Lead		Spelter	
		Electro-lytic	Tin	New York	St. Louis	New York	St. Louis	New York	St. Louis
July	Lake								
13	12.75	12.55	43.35	4.50	4.37½	5.57½	5.80		
14	12.75	12.55	43.25	4.50	4.40	5.57½	5.75		
15	12.75	12.55	.....	4.50	4.40	5.57½	5.75		
17	12.75	12.55	42.70	4.50	4.40	5.57½	5.75		
18	12.75	12.55	42.35	4.50	4.40	5.57½	5.75		
19	12.75	12.55	42.00	4.50	4.40	5.57½	5.75		

Tin is in better supply and 1½c. lower than a week ago. Copper is weak, but prices have not changed. Lead is higher in St. Louis; and unchanged, but very firm in New York. Spelter is lower.

Copper.—There is little to be said about copper except that, although the market is weak in tone, prices have not changed. Consumers seem to have filled their wants at the lower prices which prevailed early in June. There appears to be no great anxiety on the part of large holders of copper to dispose of their stocks, and the offers of cheap copper have been made by other interests having outside lots. Some sales of electrolytic

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copper have been made at 12.65c. to 12.70c. delivered in the Connecticut Valley. This is about equal to 12.50c. to 12.55c. New York, for prompt delivery. The usual quotation is the latter price and Lake cannot be had for less than 12.75c. cash, New York, although it has been sold for delivery in the Naugatuck Valley, 30 days cash, at around 12.80c., where, as a rule, the price for Lake copper sold on such terms as $\frac{1}{4}$ c. higher than the price for spot in New York. Copper has been nearly stationary in London all the week at £56 13s. 9d. for spot, and £57 5s. for futures. The exports of copper so far this month have not been very large, amounting to 17,931 tons.

Pig Tin.—Heavy arrivals of pig tin in this port have resulted in bringing the price down $\frac{1}{4}$ c. within the week and it can now be had at the import parity. Although tin is plentiful enough for all immediate needs, it is, however, not in abundant supply and any great demand might change the situation. There has been very little trading and the disappearance of the premium on spot tin has not aroused any interest among the consumers. The London market has been declining steadily for the last six days and this morning it was down to £191 10s. for spot and £184 15s. for futures. The arrivals of pig tin so far this month have amounted to 3124 tons, which is close to what is normally a full month's arrivals. There are 2464 tons afloat.

Tin Plates.—There is a good jobbing demand for tin plates, but large consumers are not buying very heavily. The price continues at \$3.94 for 100-lb. coke plates. The foreign market is weak and New York metal houses who have London connections have been informed that a reduction will shortly be made on quotations on Swansea plates as a result of the weakening of the pig tin market. At present, however, quotations are the same as they were a week ago, namely 13s. 9d. at Swansea, Wales.

Lead.—Lead has advanced in St. Louis, although there is very little buying. The market here is firm and some outside sellers are demanding more than the price asked by the leading interest. This is the first time this year that independent dealers have been above the price asked by the leading interest as they have been underselling ever since last December. To-day lead was selling at 4.40c., St. Louis, and 4.50c., New York.

Spelter.—There were some large inquiries last Thursday and Friday for spelter, but consumers refused to place orders on the terms quoted by sellers. Quotations were reduced slightly, until to-day spelter in New York is offered at 5 points less than a week ago. Those who made the inquiries, however, still refuse to do business. To-day's quotations are 5.75c., New York, and 5.57 $\frac{1}{2}$ c., St. Louis. The market shows signs of going lower.

Antimony.—Antimony continues to decline, and from all accounts some of those most deeply interested in the recent syndicate show the most anxiety to sell. Hallett's was down to 8c. this morning, which is 1c. under the price made when the syndicate tried to take control of the market. Cookson's is offered at 8.50c., but some sellers are shading that price slightly. Hungarian grades are not so weak and the usual quotation is 7.30c. Chinese grades may be had for about 5 points less than the Hungarian grades.

Old Metals.—The market is dull and barely steady, with dealers' selling prices, New York, nominally unchanged, as follows:

	Cents.
Copper, heavy cut and crucible.....	12.00 to 12.25
Copper, heavy and wire.....	11.50 to 11.75
Copper, light and bottoms.....	10.75 to 11.00
Brass, heavy.....	8.00 to 8.25
Brass, light.....	6.75 to 7.00
Heavy machine composition.....	10.50 to 10.75
Composition turnings.....	8.75 to 9.00
Clean brass turnings.....	8.00 to 8.25
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.95 to 4.00
Zinc, scrap.....	4.25 to 4.30

Chicago.

JULY 18.—The copper market has been active. Tin and lead are also in good demand. Spelter is quiet. Prices fluctuated during the week and at this writing we quote, Chicago delivery, as follows: Casting copper, 12.65c.; lake, 13.00c., in carloads, for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{4}$ c. higher; pig tin, carloads, 44c.; small lots, 46c.; lead, desilverized, 4.47 $\frac{1}{2}$ c. to 4.50c. for 50-ton lots; corroding, 4.72 $\frac{1}{2}$ c. to 4.75c. for 50-ton lots; in carloads, 2 $\frac{1}{2}$ c. per 100 lb. higher; spelter, 5.65c. to 5.70c.; Cookson's antimony, 9 $\frac{1}{4}$ c., and other grades, 8 $\frac{1}{4}$ c. to 8 $\frac{3}{4}$ c., in small lots; sheet zinc is \$7.50

f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10 $\frac{3}{4}$ c.; copper bottoms, 9 $\frac{1}{2}$ c.; copper clips, 10 $\frac{1}{4}$ c.; red brass, 9 $\frac{1}{2}$ c.; yellow brass, 7 $\frac{1}{4}$ c.; lead pipe, 3.90c.; zinc, 3.90c.; pewter, No. 1, 26c.; tin foil, 33c.; block tin pipe, 37c.

St. Louis.

JULY 18.—The metal market retains its firm condition and prices are well held here except tin, which shows the effect of the manipulators' work. The quotation here is 43.72 $\frac{1}{2}$ c. against 44.85c. last week. The demand is good. Lake copper stands at 13.10c. and electrolytic at 13c., both the same as last week, but well held and the demand good. Cookson's antimony remains unchanged at 8.85c. Lead continues in good request with the last quotations at 4.37 $\frac{1}{2}$ c. to 4.40c. Spelter is firm at 5.60c. Railroad requirements in the metal market are having some effect on the stiffness of the prices. In the ore market at Joplin blende prices have been a little weaker during the past week, ranging from \$42 per ton down to \$38, on a basis of 60 per cent. metallic zinc, though choice lots have brought as high as \$44 per ton. The contract system of selling which was inaugurated six months ago expired the past week, but virtually all producers have renewed for another six months' period. Calamine is bringing \$21 to \$23 per ton on a 40 per cent. assay, choice ore running as high as \$26. Lead ore brought during the week \$56 to \$58. Shipments continue heavier than for the same week last year. Old metals are quoted as follows: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3 $\frac{1}{4}$ c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

The German Iron Market

Abrupt Improvement in Bars

BERLIN, July 7, 1911.—Conflicting price tendencies are apparent in the iron trade, especially with bars, the most important section of the trade. It has been mentioned at various times in this correspondence that bar prices have for several months been declining, but this tendency has apparently been reversed, so far as export business is concerned. While ordinary basic steel bars were quoted at 89 to 90 marks per ton, f.o.b. Antwerp, as recently as the last week of June, a sudden rise to 93-94 marks has occurred since then, caused by the arrival of heavy orders from Japan and India. It is added that many of the big establishments now have orders running till late into the autumn as the result of this recent business. Bar prices in the home market have at least been steadied by this change in the foreign trade, although the downward movement continued until a week ago. On the Düsseldorf Exchange last week bars were quoted at 98 to 103 marks, as compared with a previous price of 101 to 105 marks. At the same time several organizations of dealers marked down the price of bars, plates and bands by 5 marks per ton for anything rolled to order and 10 marks for ordinary sizes from stock. It is reported this week, however, that the mills are asking better prices in the home market, as the natural result of the improvement in foreign business. Sales are now being made mostly at 99 to 102 marks, though some selling is still reported at lower prices. The mills are expecting a still greater improvement in bar prices for home delivery, if the latest market dispatches are to be believed.

The Pig Iron Syndicate

Much interest in the fate of the Pig Iron Syndicate is still manifested. After the Gutchoffnungs-Hütte put forward its demand for a big increase in its allotment, as previously mentioned, the period for giving notice of withdrawal from the syndicate was prolonged till tomorrow in the hope that this concern would withdraw its demand after maturer reflection. In the meantime, however, the Mathilden-Hütte in Harzburg, has given notice of its withdrawal, but it is believed that this is only a step toward negotiating for bigger allotments. A conference with the Lorraine-Luxemburg group of furnaces has been held, with the result that they declared their willingness to join upon suitable terms.

The May return of the Steel Works Union shows the largest production ever reached in the B products (bars, rods, plates, tubing, etc.). The production of bars amounted to 317,566 tons, against 288,460 tons in April, and 271,000 tons in May, 1910. Wire rods were returned at 71,297 tons, plates at 95,197 tons—both figures denoting records.

THE IRON AND METAL MARKETS

Pig Iron Imports Increasing

The foreign trade returns for June show a sudden increase in imports of pig iron. These amounted to 19,047 tons, against 9155 last year. Exports of pig reached 60,160 tons, against 58,443; blooms and ingots, 41,977, against 31,505; beams, 27,259, against 42,474; rails, 28,888, against 46,278, and ties, 6188, against 13,217.

The past fortnight has been a time of unusual activity in fusions and community of interest arrangements in the iron trade. The agreement between Deutsch-Luxemburg and the Nümelingen-St. Ingbert works, previously mentioned in this correspondence, has now been perfected. It puts Deutsch-Luxemburg in control of very valuable ore properties in the vicinity of its Diffendingen plant. The directorates of the Rheinische Stahlwerke and the Balcke, Telling Company have also worked out a plan for a community of interest arrangement under which the two companies are to be operated in common for 30 years, and the profits distributed in a fixed ratio. The latter is a tubing mill. Several years ago it paid regularly dividends of 8 to 10 per cent., but its latest was only 5 per cent. Hence the Rheinische Stahlwerke got control of it at very favorable terms, provided the agreement goes through.

The Absorption of Coal Mines

The absorption of coal mines by iron companies also continues. The Budorus Eisenwerke of Wetzlar, which has hitherto been without a fuel supply of its own, has annexed the Massen Coal Company. Budorus gives 8,400,000 marks of its own stock for the mine, bringing its capital up to 22,000,000 marks. A more important fusion, which is still under negotiation, is that of the Koelner Bergwerkeverein with the Krupp Company. The former is one of the most profitable coal mines in Germany; its dividends during the past 10 years have ranged between 25 and 30 per cent. It holds allotments of 904,000 tons of coal and 253,000 tons of coke in the Coal Syndicate. Although the Krupp Company owns three coal mines it has to buy about 1,000,000 tons of the 1,700,000 tons of coke consumed yearly. In this connection it may be mentioned that Krupp, according to a report emanating from Luxemburg, has recently acquired about 500 acres of land in Normandy for the purpose of establishing an iron and steel plant there. It was recently mentioned in this correspondence that the iron magnate, Thyssen, had begun to build a furnace plant in that region.

According to a report of the Bamberg Chamber of Commerce the ore discoveries in Franconia, already mentioned in these letters, turn out to be considerably more valuable than at first indicated. Already about 250,000 acres of claims have been taken up. About 1000 shafts are into the ore, which is only 4 to 7 feet below the surface and is 9 to 13 ft. thick. The ore can be taken out by open mining. Development work is being vigorously pushed forward.

Iron and Industrial Stocks

NEW YORK, July 19, 1911.

A very dull period has been experienced on the stock exchanges. On some days no transactions whatever occurred in some of the leading stocks. Values have been quite steadily held and in some instances good advances have taken place. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Beth. Steel, com....	32½-33½	Railway Spgs., com.	36½-37
Beth. Steel, pref....	60-62½	Republic, com.....	29½-30
Can., com.....	11-11½	Republic, pref.....	93½-93½
Can., pref.....	85½-87	Sloss, com.....	48½-49
Car & Fdry., com....	56-57½	Sloss, pref.....	112
Car & Fdry., pref....	117½	Pipe, pref.....	56½
Steel Foundries.....	38½-40	U. S. Steel, com....	78½-79½
Colorado Fuel.....	34½-36	U. S. Steel, pref....	118½-118½
General Electric....	161½-162½	Westinghouse Elec..	75½-75½
Gr. N. Ore Cert....	60½-61	Va. I. C. & Co.....	86-88
Int. Harv., com....	122-122½	Am. Ship, com.....	57-58
Int. Harv., pref....	124-124½	Am. Ship, pref....	112
Int. Pump, com....	41-42½	Chic. Pneu. Tool....	50½-52
Int. Pump, pref....	88½-89½	Cambria Steel.....	44½-45½
Locomotive, com....	40-41	Lake Sup. Corp....	25½-27
Locomotive, pref....	108	Warwick.....	10
Nat. En. & St., com.	18-20	Crucible Steel, com.	12½-13
Nat. En. & St., pref.	94½-96½	Crucible Steel, pref.	81½-82½
Pressed Steel, com..	36-36½	Harb. Walk Ref., pref.	98

Dividends Declared

The Columbia Weighing Machine Company semi-annual 4 per cent on preferred and 4 per cent on common, payable July 11.

The Canadian Car & Foundry Company, Ltd., quar-

terly 1¼ per cent on the preferred, payable July 25. The Plymouth Cordage Company, quarterly 2 per cent, payable July 20.

The International Harvester Company quarterly 1¼ per cent on preferred, payable August 1.

The Porceliron Stove Company

The above-named company, recently incorporated with a capital stock of \$25,000, under the laws of Pennsylvania, has leased a plant at Beaver Falls, Pa., which contains about 75,000 sq. ft. of manufacturing space. New machinery, consisting of emery grinders, drill presses and other equipment, is now being added. The company is in the market for machinery for polishing the tops of cooking ranges, the bodies of which will be of porceliron. The company will be in a position to contract for stove castings in about two weeks. It will also require a lot of miscellaneous fittings, such as gas valves, etc. The finished product will be porceliron cooking stoves, which will have advantages in being light, clean and attractive. Ernest Richardson is president; Lewis Ingram, vice-president; M. N. Hurd, secretary and treasurer. The product will be on the market about the latter part of September.

An Improved Hydraulic Testing Plant

The Worcester Polytechnic Institute, Worcester, Mass., has been given funds for the erection of a new building for the hydraulic testing plant in the neighboring town of Holden. The structure will be 32 x 36 ft., one story and basement, and will inclose a flume in which two vertical Hercules water wheels will be installed, working under a head of 14 ft., and developing about 40 hp. An interesting feature of the equipment will be apparatus for testing all kinds of gear drives including spur, bevel and worm gears, and also belt and rope drives of different types. In the basement the opportunity will be offered to rate Pitot tubes in pipe lines of various sizes. The hydraulic station is already well equipped for this work and the new laboratory will extend the usefulness still farther.

Safety as Applied to Grinding Wheels

The Norton Company, Worcester, Mass., has published an instructive pamphlet entitled "Safety as Applied to Grinding Wheels," which must be of much interest to every user of grinding machinery. A second title is "Preventive and Protective Safeguards—Modern Devices Which Can Be Practically Applied in the Use of Grinding Wheels and Machines." The company has given the subject a great deal of attention and has developed a number of efficient safety devices which are illustrated and described in detail in the pamphlet. Attention is also paid to the correct practice in mounting wheels, which, in itself, is a means of preventing accidents. Other topics taken up are glass shields, the leather spark brush, glasses and goggles and dust systems. Yet another subject is speed changing, attention being paid to devices for eliminating the danger of overspeeding. The company's machine for testing grinding wheels is shown.

The Union Steel Casting Company, Butler street, Pittsburgh, manufacturer of steel castings, Union truss roof annealing boxes, etc., reports that its new additions are coming along nicely. The McClintic-Marshall Construction Company is erecting the steel buildings and foundations have been placed for the two new 25-ton open-hearth furnaces. Contracts for the other equipment have been awarded and it is expected that the new plant will be ready for operation early in October.

The C. W. Raymond Company, Dayton, Ohio, manufacturer of clay working machinery, has taken an order from the Admantine Clay Products Company, Martinsburg, W. Va., for a complete equipment to manufacture 50,000 paving blocks per day. Included are a power plant, low frame pans, an 888 machine, No. 2 cutting table and all auxiliary apparatus, as well as metallic radiation dryer tunnels. A producer-gas-fired continuous kiln will burn all the brick manufactured.

Obituary

Oscar J. Beale

Oscar J. Beale, Providence, R. I., died July 16, aged 68 years. He was born in Dover, Maine, and his early life was spent on a farm. In 1856 he moved to Winthrop, Maine, where his first mechanical experience was gained. During the years following he was gathering mechanical knowledge, principally in Portland and the Portsmouth Navy Yard, and in April, 1869, he went to Providence and entered the employ of the Brown & Sharpe Mfg. Company, then located in the old shop on South Main street. In 1872 he became chief inspector.

Mr. Beale showed mechanical ability at once. Among his first inventions was the odontograph. In 1885 he became a designer. His best work has been the producing of accurate standards of measurements in the designing of measuring machines and in the perfecting of machinery for making accurate graduations. For his



OSCAR J. BEALE.

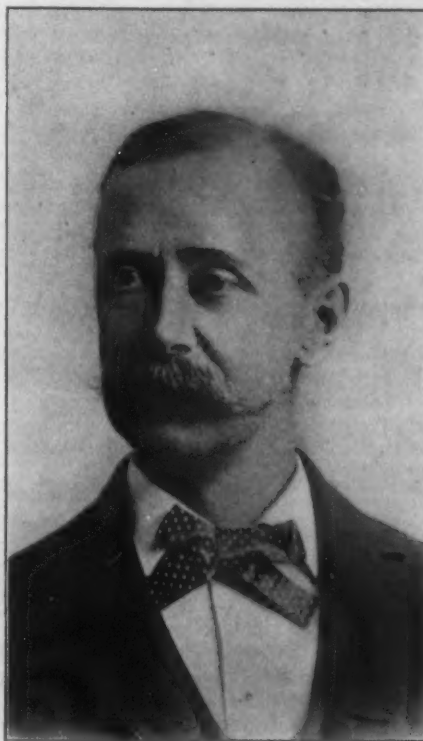
work in the study of measurements he received a diploma of honorable mention at the Columbian Exposition in 1893. Afterward the Louisiana Purchase Exposition awarded him a silver medal for being a collaborator with the Brown & Sharpe Mfg. Company.

He made the standard yard used at the factory and when it was taken to Washington it was found to be accurate to within 0.00002 in. He invented the automatic bevel gear generating machine and contributed many improvements of a varied sort which have materially benefited modern manufacturers. Many patents were taken out by him. He wrote extensively for the technical press, his articles possessing that authority which commands attention. He also produced two books of authoritative value, a "Handbook for Apprenticed Machinists," and a "Practical Treatise on Gearing."

Robert B. Humphries

Robert B. Humphries, Mansfield, Ohio, died July 10, aged 65 years. He had been in ill health for a number of years, but the immediate cause of his death was paralysis. He was one of the founders of the Humphries Mfg. Company, maker of hand and power pumps of iron and brass. Born in Newark, N. J., he went to Mansfield in 1884 and in connection with his brother John organized the company. For a number of years he held the position of superintendent. On the death of his brother, who was general manager, he assumed the duties of general manager along with those of superintendent. These positions he held un-

til he retired from the active conduct of the business, due to his decline in health. He continued to hold a connection with the company, acting as its vice-president and as a



ROBERT B. HUMPHRIES.

member of the board of directors. In his residence at Mansfield of 27 years he had become one of the city's most highly respected business men.

HARRY A. FENNERTY, Pittsburgh, for 14 years purchasing agent of the Carnegie Steel Company in that city, died July 12. He was for a time employed by the Pennsylvania Railroad and about 23 years ago became connected with the Carnegie-Phipps Company, starting in the voucher department. He was a member of the Duquesne Club, Pittsburgh Country Club and Pittsburgh Athletic Association. He leaves a widow and a son.

CHARLES S. EATON, Olympia, Wash., a member of the pig iron house of Thomas A. Mack, Cincinnati, Ohio, from 1884 to 1890, died suddenly July 14, while on a fishing trip near his home, aged 55 years. He was a brother of Frank M. Eaton, resident partner of Hickman, Williams & Co., and W. G. Eaton, of Eaton, Rhodes & Co., Cincinnati pig iron merchants.

JAMES MACKAY, long prominently identified with the heating industry and for some years a manufacturer of house heating boilers and equipment as an officer of the Kellogg-Mackay Company, Chicago, died at his home in that city, July 18, after a few weeks' illness with typhoid pneumonia. He was born in Montreal, on November 25, 1853, and began his career at the age of 13 years as apprentice in a tinsmithing, plumbing and heating business. He went into business for himself in Montreal, was later an active representative of the American Boiler Company and he helped to organize the Kellogg-Mackay-Cameron Company, which later became the Kellogg-Mackay Company. He was president of the American Society of Heating and Ventilating Engineers in 1908 and made many valuable contributions to heating engineering.

MAJOR C. BROOKS, president of the Southwark Foundry & Machine Company, Philadelphia, died suddenly, July 19, from heart disease, aged 67 years. He won the rank of major in the civil war.

It is announced that the proceedings of the Congress of Technology, held in Boston April 10 and 11, will be published. The single volume of about 500 pages, which will be sold at a moderate price, will contain the technical papers, numbering over 70, relating to many fields of industry, which were read at the celebration of the fiftieth anniversary of the granting of the charter of the Massachusetts Institute of Technology.

Personal

The steamship *Olympic*, which arrived at New York on Wednesday, brought from Europe James A. Farrell, president of the United States Steel Corporation, and Charles M. Schwab, president of the Bethlehem Steel Company.

John W. Gates has been lying at the point of death in Paris for the past week, but hopes of his recovery are now entertained.

From Youngstown, Ohio, comes the report that E. M. Wilson, who has been chosen president of the Pacific Coast Steel Company, San Francisco, Cal., was a former Youngstown attorney and held the office of probate judge in Mahoning County, Ohio, for a term. He then entered the iron business, in which he met with success. With him are interested Thomas Piggott, an experienced blast furnace man, and William Bert, an accountant experienced in steel work, both formerly of Youngstown. The Pacific Coast Steel Company recently took over several plants on the Pacific coast, including works at San Francisco, Portland, Ore., and Seattle, Wash.

George D. Evans, formerly in charge of the Bray continuous sheet mill of the American Sheet & Tin Plate Company, Sharon, Pa., and now superintendent of the Carnakan Tin Plate & Sheet Company, Canton, Ohio, is seriously ill, and little hopes are entertained for his recovery.

Richard G. Wood, vice-president of the Alan Wood Iron & Steel Company, Philadelphia, has been elected president, succeeding the late Howard Wood. Jonathan R. Jones, formerly secretary and treasurer, has been elected vice-president and treasurer. W. W. Lukens has been elected secretary and assistant treasurer.

C. S. Lomax, formerly American representative of the Coal Distillation Company, 1211 Singer Building, New York, is now employed by Dr. F. S. Pearson. Thomas Littlehales, for many years connected with the American Coke & Gas Construction Company, Camden, N. J., has been appointed to succeed Mr. Lomax.

W. A. Sterns has resigned as mechanical engineer of the Louisville & Nashville at Louisville, Ky., to become assistant to the chief mechanical engineer of the American Steel Foundries at St. Louis.

J. C. Hussey, of the publicity department of the American Tool Works Company, Cincinnati, Ohio, has gone on a vacation trip to Canada.

W. L. Friedlander, president of the Hisey-Wolf Machine Company, Cincinnati, Ohio, has returned from a few weeks' vacation in Canada.

James N. Heald, treasurer and manager of the Heald Machine Company, Worcester, Mass., has returned from a six weeks' European trip in which he combined business with recreation.

R. A. Rung, who was lately connected with the selling force of the New York offices of Schuchardt & Schutte, has gone to Vienna, where he will take charge of the Austrian territory for the Allied Machinery Company of America.

E. W. Patten, lately of the New York offices of Schuchardt & Schutte, has joined the sales force of the Marshall & Huschart Machinery Company, Chicago.

Louis P. Zimmerman, Cincinnati, correspondent of the Iron Trade Review, has resigned to engage in business on his own account in Minneapolis, Minn.

C. N. Thorn has resigned his position of purchasing agent of Hugh Kelly & Co., New York, to become affiliated with the Allied Machinery Company of America, New York, in the capacity of assistant general manager.

J. J. Chisholm, formerly chief engineer of power house of the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has assumed the duties of superintendent of power for the Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

W. A. Grieves, manager of the employment department of the Jeffrey Mfg. Company, Columbus, Ohio, has been appointed by Governor Harmon as one of the Board of Awards under the new Ohio employers' liability law.

Robert Wuest, commissioner of the National Metal Trades Association, has returned from a six weeks' trip to Europe.

W. R. Grace, vice-president and treasurer of the Ingersoll-Rand Company, 11 Broadway, New York, has returned from Europe after a two months' absence.

Ingram-Richardson Improvements.—The Ingram-Richardson Mfg. Company, Beaver Falls, Pa., manufacturer of enameled metal signs, has built an extension to its boiler house in which it has installed a new Erie City 150-hp return tubular boiler, a 320-hp Buckeye engine direct connected to a 200-kw Crocker-Wheeler generator for lighting and power purposes and a new switch board. Under erection is a new pickling department, of brick and steel construction, 50 x 50 ft., in which a pickling machine, special drying furnaces, portable tracks for a new industrial system, etc., are to be installed. A. M. Allen & Co., Cleveland, Ohio, made the plans for this work. A new carpenter shop is being added; it is of frame construction, about 50 x 50 ft., and the equipment has been purchased. The company is also rearranging its machinery for grinding enamels, each machine to have its individual motor. Part of these have already been equipped. The motors required range from 10 to 30 hp each.

Railroad Equipment Orders.—Orders for railroad equipment have been given out as follows: The Canadian Northern, 20 consolidation locomotives and 200 box cars; the Proctor & Gamble Company, in the market for 100 tank cars; the Chicago, Memphis & Gulf, in the market for 100 box and flat cars; the Havana Central, Cuba, in the market for 300 to 400 box cars; the Boston Elevated making inquiries for 50 car bodies.

The Hercules Motor Truck & Car Company, Grove City, Pa., manufacturer of commercial motor trucks, has been testing its first car for the last two months. The test having proved satisfactory, the Bessemer Gas Engine Company, also of Grove City, purchased the machine. It will be used in transferring material and engines from one department to another and between the plant and the freight stations. The Hercules Company expects to have more motors ready to test out within the next 60 to 90 days.

The Wheeling Corrugating Company, manufacturer of sheet metal and sheet-metal products, Wheeling, W. Va., on September 1 will open a branch office and warehouse at Tenth and Hickory streets, Kansas City, Mo. Large stocks of all lines will be carried for prompt delivery. The branch will be in charge of H. J. Morgan, who has been assistant manager of St. Louis. A goodly number of salesmen will travel the territory. This is the sixth of a chain of large distributing stations.

The Puxico Iron Company, Pilot Knob, Mo., miner of brown and specular iron ore, states that it has placed the old Pilot Knob mine in a good, lively producing state, notwithstanding the skepticism of many who scoffed at the attempt to operate the property again.

The working of the Japanese protective tariff, which went into effect July 17, is shown in the placing with Japanese mills of some 4000 tons of light structural material for electric power transmission towers. Designs and tenders had been received from American steel interests, but the contract was not secured. The towers, 1,258 in all, are for use in conducting electricity from the plant of the Kinugawa Hydro-Electric Power Company at Shimotaki to Tokio, 77 miles distant. It is understood that Japan is also to furnish the copper transmission wire.

The steamship *Harvester*, built for the Wisconsin Steel Company, subsidiary of the International Harvester Company, was launched July 15 at the Lorain yard of the American Shipbuilding Company. The *Harvester* is the third vessel to be built on the lakes of the Isherwood construction. This boat is 545 ft. long with 58-ft. beam.

The city of Erie, Pa., has employed the firm of Chester & Fleming, consulting engineers, Pittsburgh, to prepare preliminary plans and estimates for extensive improvements to the water works system.

The Georgian Mfg. Company's Proposed Enlargements.—The Georgian Mfg. Company, Binghamton, N. Y., will erect an addition to its machine shop, 64 by 175 ft., two stories and basement, of the gallery type. It will be used for the machining of the company's iron and brass valves, the demand for which has so increased that an enlarged capacity has become necessary. The building will be of concrete, brick and steel. Electric traveling cranes will serve the shop floor, and each line shaft will have its individual motor. The machinery will be of the company's special design. Increased facilities for testing and assembling the new output will be provided, and upon the completion of the building, which should be within 90 days, the working force will be enlarged 50 per cent. The company's product is sold through the Fairbanks Company, 416 Broome street, New York City.

The Robertshaw Mfg. Company.—This company has secured quarters in a building located at Ferry and Water streets, Pittsburgh, where it is installing a line of lathes, drills, grinders, etc., for the manufacture of Robertshaw thermostats, Excelsior ball cocks and brass machine work. Frederick W. Robertshaw, superintendent of the Acheson Mfg. Company, Rankin, Pa., has severed his connection with that concern to take charge of the first-mentioned company. He is well known in plumbing circles, and the sale of his plumbing specialties has increased to such an extent that it is necessary for him to increase the facilities for their manufacture, besides giving the business his individual attention.

A. M. Byers & Co., Inc., Pittsburgh, will place 46 puddling furnaces in operation July 31, with its No. 2 puddling mill which will give employment to 200 additional workmen. The company has not yet awarded the contract for another continuous heating furnace for the 72-in. mill and may not take such action for some time, although the installation is being considered. It is installing a Hughes gas producer, similar to the one now being operated. This will be ready for operation in August.

The Stove & Range Company of Pittsburgh has recently made some changes among its officials as follows: G. W. J. Bissell, formerly president, has been succeeded by William H. Schoen, well known in manufacturing circles. John S. Graham, former secretary and treasurer, recently resigned owing to ill health, has been succeeded by H. E. Porter. H. M. Baldwin continues as vice-president and manager of sales. The company has moved its offices from Robinson and Darragh streets, North Side, Pittsburgh, to suite 907 Columbia Bank Building. This building is centrally located and enables the company to handle its business to better advantage.

The business of J. P. Kemp, 19 East Lombard street, Baltimore, Md., will hereafter be carried on under the name of the Kemp Machinery Company. S. V. Kemp, who has had a wide experience in practical mechanical and engineering work, has become associated with the business. The company will specialize on machine tool equipments and is the authorized representative of a number of well-known manufacturers, including the Lodge & Shipley Machine Tool Company, Cincinnati Milling Machine Company, Cincinnati Bickford Tool Company, Cincinnati Planer Company, Colburn Machine Tool Company, Acme Machine Tool Company, Mechanics Machine Company, Gould & Eberhardt, Lea Equipment Company and Loew Mfg. Company.

S. N. Craig, vice-president of the Treadwell Construction Company, Midland, Pa., states that his company contracted last month with the Los Angeles Aqueduct Commission for five steel syphons, which will require 4200 tons of plates and 300 tons of rivets, to make pipes 9 ft. 3 in., 10 ft. and 11 ft. in diameter. The plates and rivets for this work are to be furnished by Pittsburgh makers. This contract, with other plate work, consisting principally of tanks, ladles, etc., will give the Treadwell Construction Company approximately five months' work.

A patent on a cinder car was granted July 11 to Erwin Sherman, Youngstown, Ohio. It has been assigned to the William B. Pollock Company, Youngstown. The patent number is 997,639.

Amalgamated Scale Signers

The national office of the Amalgamated Association of Iron, Steel and Tin Workers has received signed scales from the following mills:

Pope Tin Plate Company, Steubenville, Ohio.
Follansbee Brothers Company, Follansbee, W. Va.
N. & G. Taylor Company, Cumberland, Md.
Empire Iron & Steel Company, Niles, Ohio.
National Enameling & Stamping Company, St. Louis, Mo., and Granite City, Ill.
Zug Iron & Steel Company, Pittsburgh, Pa.
Youngstown Iron & Steel Company, Youngstown, Ohio.
American Rolling Mill Company, Middletown, Ohio.
Newport Rolling Mill Company, Newport, Ky.
Whitaker-Glessner Company, Wheeling, W. Va., and Martins Ferry, Ohio.
Thomas Steel Company, Niles, Ohio.
Cleveland Hardware Company, Cleveland, Ohio.
Tyler Tube & Pipe Company, Washington, Pa.
Texas Rolling Mill Company, Ft. Worth, Texas.
Licking Rolling Mill Company, Covington, Ky.
Carnahan Tin Plate & Sheet Company, Canton, Ohio.
De Forest Sheet & Tin Plate Company, Niles, Ohio.
Pittsburgh Forge & Iron Company, Pittsburgh, Pa.
Lockhart Iron & Steel Company, McKees Rocks, Pa.
Standard Chain Company, Columbus, Ohio.
Joliet Rolling Mill Company, Joliet, Ill.
Republic Iron & Steel Company for its works as follows: Mahoning Valley Works, Youngstown, Ohio; Brown-Bonell Works, Youngstown, Ohio; Inland Works, East Chicago, Ind.; Tudor Works, East St. Louis, Ill.; Sylvan Works, Moline, Ill.; Toledo Works, Toledo, Ohio; Gate City Works, Gate City, Ala.
American Car & Foundry Company, Detroit, Mich.
Empire Rolling Mill Company, Cleveland, Ohio.
Ft. Wayne Rolling Mill Co., Ft. Wayne, Ind.
Highland Iron & Steel Company, Terre Haute, Ind., and Blue Island, Ill.
Interstate Iron & Steel Company, East Chicago, Ind.
Helmbacher Forge & Rolling Mill Company, St. Louis, Mo., and Madison, Ill.
Kansas City Bolt & Nut Company, Kansas City, Mo.
Lake Erie Iron Company, Cleveland, Ohio.
National Rolling Mill Company, Vincennes, Ind.
Ohio Falls Iron Company, New Albany, Ind.
Railway Steel Spring Company, Detroit, Mich.
Union Rolling Mill Company, Cleveland, Ohio.

Air Compressors for Light Work.

The Automatic Pittsburgh Air Pump Company, Inc., Pittsburgh, has erected a manufacturing building of fire-proof construction. It is equipped with motor-driven machine tools which were furnished by the Brown & Zortman Machinery Company, Pittsburgh. The motors were manufactured by the Burke Electric Company, Erie, Pa. The company's products are direct-connected, motor-driven air compressors, automatic and non-automatic; also belt-driven compressors for all purposes, from 25 to 150 lb. pressure per square inch. Its principal lines of manufacture are air compressors for bar purposes; deep wells, whitewashing, paint spraying and garage use. Mounted on automobiles, these compressors do away with cranking in starting the engine and take care of tire troubles. An illustrated folder describes the several designs. H. E. Hunt is president; F. U. Price, vice-president; A. S. Manchester, secretary, and S. H. Bennett, treasurer. The plant is in full operation on miscellaneous orders.

The Republic Iron & Steel Company is operating six out of eight open-hearth furnaces at its Haselton, Ohio, plant, while the Brown-Bonell and the Mahoning Valley Works, both at Youngstown, are being operated to capacity. The 6-in. and 18-in. finishing mills and the old puddle mill at the Mahoning plant resumed work last week. The company has been somewhat delayed in completing its new office building at Youngstown, but it will be ready for occupancy August 20, when the general offices now located in the Oliver Building, Pittsburgh, will be removed to Youngstown.

The Slatington Rolling Mills is the name of a new corporation which has been formed to take over the entire plant and good will, exclusive of the book accounts, of the Slatington Rolling Mill Company at Slatington, Pa., in the Lehigh Valley. The new company is making alterations and repairs and expects to have the plant completely overhauled and in readiness to operate within a few months. The superintendent of the plant has had long experience in manufacturing high-grade bar iron.

The Lawlor Molding Machine Company has moved its offices from the Century Building to the headquarters of the Union Foundry & Machine Company, on West Carson street, Pittsburgh. The latter concern makes the Lawlor line of jarring and squeezing machines, and the Lawlor Company considered it desirable to locate at the plant.

International Iron and Steel Conference

No Association Formed at the Brussels Meeting, but the Whole Matter Is Referred to a Committee Representing the Different Countries

(EDITORIAL CORRESPONDENCE)

BRUSSELS, BELGIUM, July 5, 1911.—The American delegation to the international iron and steel conference recognized Independence Day by holding an informal dinner at the Laiterie in the Bois de la Cambre, one of the numerous fine parks which are the pride of Brussels. The affair was organized in the afternoon of July 4, and was participated in by nearly all the American contingent, including the ladies of the party. The Baron and Baroness von Bodenhausen were also present. E. A. S. Clarke was introduced by Mr. Butler as toastmaster, and remarks were made by C. M. Schwab, E. C. Felton, Willis L. King, Powell Stackhouse, James A. Campbell and T. J. Drummond, who spoke for Canada. The speakers, as guests in a foreign city, avoided mere glorification of their home country, dwelling rather on the pleasant auspices under which they were gathered and the good fellowship which existed, heightened as it was by the spirit of the great national holiday.

A particularly pleasant incident of the late evening was the addition to the American party of a number of representatives of Great Britain who had been dining in the same garden. Following the demonstration which marked their entrance, Sir Hugh Bell spoke most felicitously and was roundly applauded.

BRUSSELS, BELGIUM, July 6, 1911.—The Brussels conference of American and European iron and steel manufacturers, which has been looked forward to as of much significance to the world's iron trade, adjourned today. The first session, held yesterday morning, really compassed all the formal action of the meeting—the passing of a resolution referring to a committee the whole question of an international iron and steel association—and the brief second session of today was simply for the announcement of the membership of the committee.

The convention did not undertake to decide whether the proposed association is desirable or feasible, though the tenor of the discussions was favorable, and the size and character of the delegations, especially from the leading steel producing countries, indicated that the idea had taken a strong hold on some of the most important interests engaged in international trade.

It is of more than passing moment that the American type of publicity in matters affecting important industries was indorsed by the convention when it decided to have all its proceedings reported by stenographers and afterward printed in full and given to the press. Meantime, however, only an outline of the transactions is available.

The committee in whose hands now rests the question of an international organization on the lines of the American Iron and Steel Institute may report for or against the proposal, and it is empowered to call another international meeting whenever it has a report ready. It appears, therefore, that the movement, to which some impetus was given by the international iron and steel conference in New York last October, will require time in proportion to the magnitude and diversity of the interests involved.

Full Representation of Important Companies

What makes the meeting most remarkable was the very full representation of the important iron and steel companies in the respective countries. Counting the American delegation as standing in a sense for all the membership of the American Iron and Steel Institute, it may fairly be estimated that fully 80 per cent. of the world's steel production was represented. No such gathering of steel manufacturers has ever been held, and outside of the United States (and possibly Germany) no meeting in any of the countries has brought together so full a representation of its steel producing capacity.

There is no large basis for prediction as to the final outcome of the conference. Its immediate result is the formation of an acquaintance and friendliness among international competitors. Much weight is given in the informal

discussion of its fruits to the fact that so many of the chief men in the industry in the leading countries of Europe were willing to come together even to consider cooperation.

It hardly need be said that the single important resolution passed had little in it to bring out differences of opinion and that its adoption gives no indication of what sort of organization, if any, could be formed or what would be its scope and its influence on the international trade in steel. It may be doubted if any cooperative movement is possible which would have a very direct or widespread effect upon prices, and no serious thought need be given to any newspaper talk of an international steel trust. International commercial rivalry is too strong to be much affected by any such mild mannered movement as is now talked of, taking form in some sort of international advisory committee. It was suggested in the discussion of Wednesday morning that there is much more in cooperation among steel manufacturers than the question of prices, which is ordinarily put first. A manufacturers' organization, it was pointed out, might aid in the unification of specifications—a work on which the engineering societies have been making commendable progress. It might also give direction to the betterment of labor conditions, as has already been done in the United States in the face of not a little cynicism and distrust.

Since the United States started the international movement and is the country in which cooperation among producers is looked upon with most suspicion, it is evident that developments in our own country will have much to do with further organization. It may be that a provision for national incorporation of American consolidations, with some legislation by which, under government advice and oversight, the large producers of steel and other commodities may know more clearly what they may do lawfully in respect to production and prices, will have to precede any important action in conjunction with steel producers abroad—that is to say, action affecting generally the international trade in iron and steel.

The First Day's Meeting

The sessions were held at the Salles des Fêtes, of the Restaurant de la Monnaie, and that of Wednesday, July 5, was called to order at 10:30 o'clock by A. Greiner, of the Cockerill Works, Seraing, Belgium. On his nomination Judge E. H. Gary was made chairman of the convention, and W. B. Peat, London, England, of the auditing firm of W. B. Peat & Co., was chosen secretary. In outlining the objects of the meeting Judge Gary spoke as follows:

Judge Gary's Speech

As one of the large number who are responsible for bringing together this large assemblage of distinguished representatives of the iron and steel industry throughout the world, I beg to express grateful appreciation of your presence.

I am most unfortunate in being unable to speak a language or languages understood by all who honor me by their attention. It may be suggested, however, that many of us have learned by experience that our hearts speak the same language and that our instincts concerning everything worthy are the same; that to know what is the best thing and the right thing to do, is the chief desire of all. The fact that so many leading men interested in one of the most important and competitive branches of industrial activity have voluntarily met to take one another by the hand is significant. The coming together from long distances to look one another full in the face with a confident desire to unselfishly advance the welfare of each other may excite surprise on the part of onlookers, but when understood should secure the admiration of all.

THE WORLD IS GROWING BETTER

In the long past, to a greater or lesser extent, business has meant business just as war has meant war, to use a common expression. We have been actuated by motives of

commodity, we have been selfish, narrow and shortsighted. Our individual rights have been paramount to those of our neighbors.

In the treatment of competitors, customers and employees we have in some measure at least dealt at arm's length. Believing we were acting in self-defense—often forced to the conclusion—we have been quite inclined to extend the club rather than to offer the olive branch. And as the result of hasty conclusion, we have often been properly chargeable with injustice. To the extent we have thus governed our conduct we have not stood on the platform of good morals or good policy. We have brought upon ourselves unnecessary difficulty, trouble and loss. For the many disagreeable conditions sometimes appearing in connection with our various and varied responsibilities—known and realized by all of us and not necessary to be referred to in detail at this time—we are partly at fault. But the world is growing better. Nations are coming to realize that arbitration is better than war; that justice is superior to power; that the settlement of any question should be based upon what is right rather than upon the strength of arms or the power of money; and that for every reason, even from the selfish view, it is to the interest of every nation to secure and maintain the most intimate and friendly relations with all other nations.

Many of those who are here will live to see the day when war is a thing of the past and when every nation will adopt the sentiment that "right makes might," when all will be disposed to "live and let live."

IDEALS IN BUSINESS.

Is it saying too much to express the hope that representatives of the steel industry throughout the world, acting in harmony and presenting an undivided front, may be of use in assisting to bring about universal peace? It is believed that what can be and will be realized by nations is not impossible as applied to the every-day business life. That there are many difficulties in the way; that time and patience and above all honest effort and unreserved sincerity are requisite in order to reach a satisfactory solution, no thinking person will deny. The skeptic may, the practical and successful business man will, be tempted to shrug the shoulder, to say that we are groping in the land of dreams, that we are endeavoring to substitute ideas for practical results of experience. But on reflection who would not wish for ideals in business if it were possible to secure them? How much better and more comfortable it would be if we could at all times know that we had the approval and commendation of the general public; if we should never have any controversy, however good natured, with our employees; if our customers without exception were satisfied with our treatment; if healthy competition, however aggressive, should take the place of bitter and destructive competition.

Even a doubting Thomas would admit the desirability of all this; and if so he would be relegated to the claim that it is impossible; that long experience has taught that selfishness is the controlling element in the conduct of mankind.

Is it practicable and desirable? Let us for a moment deal in imagination. Suppose a company of men engaged in business, possessed of much capital and power and influence, should by conduct unjust or oppressive secure universal disapproval, disgust and antagonism on the part of the public. In a brief space of time these men would be driven out of business.

Suppose the producer of any commodity for sale should in any way within his power ill-treat all his customers. How long before the producer would be in bankruptcy? Suppose the employer of labor manifestly treats the employed unfairly and cruelly. In a short time, as the result of action on the part of those interested, aided by public sentiment, a remedy would be found, and this after great interruption to business and loss of money.

Again, let us assume that during a given year the demand for a product equals less than half the capacity to produce, and yet each producer is greedy and anxious to sell more than his fair proportion and acts accordingly, and this attitude is maintained until the destructive results, which we all know, are almost certain to be realized.

These commonplace references may serve to present the question that it is at least practically beneficial to secure, if we can, the ideal in business; that from the viewpoint of good policy it is profitable to reach a position so high and so near perfection that at the first blush it appears to be Utopian.

HOW TO BRING ABOUT BETTER RELATIONS.

It is insisted that the most intelligent consideration of these questions leads to the conclusion that it is the part of wisdom, even from a selfish, pecuniary standpoint, to conduct our affairs in such a way that we may not be justly reproached. But can we bring about the conditions which we so much desire? It is to be regretted that there seems to be no certain, easy and summary way of securing

all that we might wish in this respect. Still we need not despair. If we have the right disposition, courage and patience and if we apply our highest thought, it is believed we may in the course of time reach a position which it will be a pleasure and an honor to occupy. If so, we shall have done something worth while for ourselves, and what is better, for all others who are dependent upon our attitude and conduct. The first essential is a thorough acquaintance with each other. This means that each must learn by actual contact and frequent intercourse how much merit and how little fault is possessed by all others; how desirous everyone really is to have the respect, the confidence and the affectionate regard of others; how mistaken each of us has been in supposing that his inclinations were better and fairer than those of others. There should be established and continuously maintained a business friendship which compels one to feel the same concern for his neighbor that he has for himself. It is no less in principle than the Golden Rule applied in business. Is it possible? If it is, it certainly will pay.

Many of you know by long and intimate acquaintance with others that all that has been suggested in regard to the desirability of reaching a satisfactory basis of business friendship is entitled to our most careful consideration. True it is that sometimes and too often deceit is practiced and advantages taken by those who have been given the confidence of others. But this fact should dishearten no one. Take, for example, any two men in this room who are engaged in competitive business, but who are sufficiently acquainted to have entire confidence in each other. Is there any doubt that in the daily conduct of their affairs neither will be disposed to do anything unneighborly or unreasonable toward the other, or that the acquaintance will bring to both better results than could be realized if they were unfriendly or engaged in a bitter and destructive competition. If they are in frequent discussion of the questions in which they are interested, freely interchanging opinions, frankly disclosing the conditions concerning their business, will not the individual conclusions reached by each naturally be of a higher order and more satisfactory in every particular? And the argument, if sound, applies with greater force whenever a large number are in the habit of meeting one another with the same spirit of friendship which exists with reference to the smaller number.

BUSINESS CONDITIONS IN AMERICA.

If it is pardonable to refer to conditions in America, for the reason that I am familiar with them, I should like to say that during the last few years there has been a wonderful demonstration of the possibility of applying, in matters of business, the principles of what have been termed conciliation and cooperation.

No doubt all present are acquainted with the facts. It is sufficient to say that as a result it is beyond question that the iron and steel industry there, taken as a whole, is on a higher and better plane than ever before that the methods generally pursued are far preferable to those of the days long since past. The interests of all those connected with the industry as well as others closely or remotely affected have been promoted. Frequent intercourse and intimate acquaintance have brought about respect and confidence. Knowledge by each of the business and methods of others has enabled every one to improve his practice, to lower his cost of production and administration and has influenced to a marked degree each one to have higher regard and greater consideration for those with whom he comes in contact, including those for whose welfare he is in a large degree responsible. There has been success in the movement on the only basis that any similar action can succeed—namely, results that are beneficial to all concerned and injurious to no one. We cannot prosper on any other lines and none of us would expect the contrary. What has been said of the steel industry in America no doubt can be said with greater force in respect to some of the other countries at least, which are far in advance of manufacturers in America in many particulars. In the ranks of real progress you occupy places which entitle you to the respect and admiration of all who are familiar with your attainments. Americans are pleased to recognize your ability, your skill and your wonderful success.

AMERICAN AND EUROPEAN RELATIONS.

It should go without saying, Americans are anxious to get and to keep near their European friends. We can and we wish to learn from you much that would be of profit to ourselves. We are not so mean as to pretend that close and abiding friendship with you is not of great advantage to us. We are, however, bold enough to come to the manufacturers of Europe with the same confidence that we would approach each other in our own country; because in the past you have in many ways, at all times and under all circumstances, furnished evidence of your unqualified esteem. I need not say, indeed I am unable to express in words, that on the occasion of this visit we who come from

America have had from our brethren in Europe a reception and hospitality which for generous cordiality has never been excelled. Our gratitude is unbounded; our obligations beyond estimate; and whatever we may decide upon at this time, we hope the relations which now exist between all the members of the great fraternity engaged in the iron and steel industry throughout the world may never become less intimate than they are at present.

It has been the ambition and expressed wish of many who are present that there might be formed an international iron and steel association or an organization of some kind, which would be calculated to cement the existing fraternal relations and which might afford opportunity for the interchange of opinions and information between the iron and steel producers of the world, concerning all the questions relating to the industry—an organization distinguished from and broader in its scope and activities than the existing great and splendid institutions which have become so thoroughly established and which have potential force and influence in many directions.

THE NEED OF AN INTERNATIONAL ORGANIZATION.

Whether or not there is need for such an organization as the one now under discussion, or what would be the result, or whether or not the benefits to be derived are sufficient to justify the undertaking, are questions to be considered. It has seemed to me that if we could have a common meeting place where the iron and steel manufacturers of the world could meet for the discussion of economical, ethical and sociological questions it would be useful. It would appear that an institution having aims and objects like those I have suggested might be a great influence for good. If it stood for the ideals in business, and should reach a measure of success in this respect we would have cause to be gratified with the results. Certainly it would be an honor to be enrolled on the list of membership. No member would be disposed to do anything dishonorable towards another member. I believe it feasible to organize and conduct an organization which would be valuable in its results. Necessarily it should be formed and managed so as to avoid any antagonism or interference with any other institution and so as to secure the approval of public sentiment. If all of us who are considering the matter approach the subject with the proper spirit, if we are in earnest, if we are frank and unselfish, we may accomplish much. Many will see difficulties, and there would be many, especially in administration. We may determine after full deliberation that what is proposed is not practicable although desirable; but it is worthy of our unbiased attention.

However high and commendatory our actions and objects, we must nevertheless exercise reason and prudence, looking far ahead for the purpose of seeing if possible what will be the effect upon our respective interests and upon those of others. I think all will agree that it is better to go right than to go rapidly; that all the matters involved should receive great deliberation before final conclusion. If so, I would suggest that if after full discussion we decide that the question of forming an international association has merit, we should at this meeting appoint a committee, made up, say, of two or three from each country to consider the whole subject and report their conclusion and recommendation at a future meeting to be determined upon and called by the committee.

Whatever may be the decision, I beg to express the hope that the bonds of business friendship which now bind us together may never be loosened; that as we become better acquainted, our feeling of friendship and confidence may be increased; that our hopes and aspirations and even our dreams may be realized; that we may be happy in the belief that we have done something to place and to keep our department of industrial life on a plane which entitles it to respect and influence.

In any event, all of us who have been permitted to enjoy the hospitality of this beautiful city and country will so long as we live cherish the memory of the exquisite pleasure which has been afforded by our visit.

Expressions by Other Speakers

Expressions were called for of the views of the various delegations, as these had been brought out in some cases in conferences, by countries, held previous to the general meeting. The speakers were Sir John Randles and Sir Hugh Bell of England, Baron von Bodenhause and Fritz Thyssen of Germany, A. Greiner and G. Trasenster of Belgium, A. Dreux of France, W. Kestranek of Austria, Armin von Biro of Hungary, Count de Zubiria of Spain, M. Witmeur of Russia, T. J. Drummond of Canada and J. A. Farrell, C. M. Schwab, Willis L. King and E. A. S. Clarke.

The following resolution, proposed by Sir Hugh Bell and seconded by Baron von Bodenhause, was unanimously adopted:

That this meeting thanks his honor, Judge Gary, for his address and approves the views therein expressed. The meeting accepts the suggestion that a committee be appointed to consider in what manner practical effect can be given to these views such committee to consist of not more than five representatives from each country, and to be empowered to consider the full question and to report the results of its labors at a subsequent meeting to be convened by the committee.

Adjournment was then taken until Thursday morning at 10 o'clock, with the understanding that the respective delegations would meet meantime and select their representatives on the general committee.

Thursday's Proceedings

Little time was given to the formal proceedings of Thursday morning, when the second and final session was held. In fact, the deliberations of the full convention at both the sessions occupied scarcely more than three hours. The announcements of members of the Committee on Organization were made by the different delegations as follows:

United States.—Elbert H. Gary, James A. Farrell, E. A. S. Clarke, Charles M. Schwab, Willis L. King.

Great Britain.—G. Scoby-Smith, Bolckow, Vaughan & Co., Ltd., Middlesbrough; Sir John Randles, Workington Iron & Steel Company, Ltd.; Harry Steel, Jr., Steel, Peech & Tozer, Ltd.; M. Mannaberg, Frodingham Iron & Steel Company, Ltd.; Archibald Colville, David Colville & Sons, Ltd.

Germany.—Baron von Bodenhause, E. Schaltenbrand (chairman German Steel Syndicate), F. Thyssen, Herr Reusch and Dr. E. Schroedter.

Belgium.—A. Greiner, G. Trasenster, F. Lacanne and Messieurs Demoulin and Renson.

France.—Messieurs A. Dreux, Pralon, Laurent, de Labriolle and L. Charbonnel.

Austria.—A. R. von Kerpely, Wilhelm Kestranek, Dr. F. Schuster.

Hungary.—Armin von Biro.

Russia.—J. Jasiukowics, O. Bibet.

Spain.—Count de Zubiria.

Judge Gary brought the convention to a close with a few words of congratulation on the good spirit which had prevailed, expressing the hope that the work of the international committee might be carried forward to the satisfaction of all who had shared in its creation.

At a meeting of the committee held after the adjournment Judge Gary was chosen chairman and W. B. Peat, London, secretary. The calling of a meeting of the committee to take up its work was left with the chairman. Judge Gary has made no decision as to the time or the country, and the matter may remain in abeyance for some months.

Entertainment

The first of the social features of the meeting was a dinner to the delegates given on Wednesday evening, July 5, at the Restaurant la Royale, rue d'Arenberg. About 125 guests attended, including a number of Belgian guests who had not participated in the convention. A. Greiner presided and introduced the after-dinner programme with an address bristling with humor. Judge Gary made the first response and was followed by Baron von Bodenhause, Sir Hugh Bell, Baron Laveleye, Hugo von Noot, W. Kestranek and others, the speeches being all of a high order of excellence.

Luncheon was served to the delegates Thursday in rooms adjoining the meeting hall, and at 1:30 they were driven to the Royal Palace, where a reception was given by King Albert. The palace is on the hill, or upper town, facing the principal park of the city. Later in the afternoon the members of the convention and the visiting ladies were taken in automobiles to Waterloo, thence to Ter-vueren, a suburb about 10 miles out, hidden behind the Forest of Soignes. It contains the new Colonial Palace, opened in 1910, to which have been transferred the rich Colonial collections formerly found in the Palais du Congo, built for the Brussels Exposition of 1897. Returning to the city, the guests were entertained at dinner at the Laiterie in the Bois de la Cambre.

In spite of the strenuous entertainment of Thursday, an early start was made on Friday, a special train at 8 o'clock taking the guests to Namur. Here motor cars were provided and a trip was made to Han through the beautiful Meuse Valley by way of Durant. The famous Han

grottoes were visited in the afternoon, and the journey was continued to Rochefort, where train was taken for Brussels, dinner being served on the return trip.

Those in Attendance

The list of the delegates to the convention, as given out by the secretary, is given below. We have inserted the official connections of those present from the United States. This information was not made available in the case of the other delegations, though a number of them, particularly in the British list, will be recognized by readers in the United States as connected with important firms. The lack of detail in the compilation is certainly regrettable:

UNITED STATES.

J. G. Butler, Jr., president Bessemer Pig Iron Association; James A. Campbell, president Youngstown Sheet & Tube Company; E. A. S. Clarke, president Lackawanna Steel Company; James A. Farrell, president United States Steel Corporation; E. C. Felton, president Pennsylvania Steel Company; Elbert H. Gary, chairman United States Steel Corporation; Willis L. King, vice-president Jones & Laughlin Steel Company; Wm. A. Rogers, president Rogers-Brown Iron Company; Charles M. Schwab, president Bethlehem Steel Company; Powell Stackhouse, director Cambria Steel Company. Hon. James T. McCleary, secretary of the American Iron and Steel Institute, was prevented from attending by illness in his family.

AUSTRIA.

W. Kestranek,
Hugo von Noot,
Carl Noot,
Dr. E. Herz,
A. R. von Kerpely,
Oscar Rothballer,
Dr. F. Schuster.

BELGIUM.

G. Trasenster,
A. Greiner,
Van Hoergaerden,
Jacques Ochs,
G. Renson,
Demoulin,
Fr. Lemaire,
C. Bourgy,
Stoumon,
Lacanne,
F. Spalart,
Paul Keim,
A. Rabault,
E. Tonneau,
A. J. Dudgeon,
Stouls,
L. Spaak,
Baron de Laveleye,
J. B. Dessart,
Aug. Collon.

GREAT BRITAIN.

Sir J. S. Randles,
Sir Charles Allen,
Arthur Cooper,
R. Dyson,
I. S. Gibson,
W. H. Hewlett,
H. Steel, Jr.,
Herbert Eccles,
F. W. Gilbertson,
A. Darby,
E. Peter Jones,
E. T. John, M. P.,
C. J. Bagley,
M. Mannaberg,
Geo. Ainsworth,
Geo. Hatton,
Thompson Jowett,
W. Simons,
G. A. Mitchell,
D. Colville,
Lincoln Chandler,
A. Good,
W. J. Armitage,
N. Retallack,
E. Cottam,
W. P. Rylands,
I. H. Chapman,

W. S. Laycock,
Hy. Summers,
G. Scoby-Smith,
Sir Hugh Bell,
F. Scott Smith,
Robert MacLaren,
Cecil A. Cochrane.

CANADA.

J. T. Drummond, Lake Superior Corporation,
J. H. Plummer, Dominion Steel Corporation.

FRANCE.

A. Dreux,
A. Resimont,
Jules Bernard,
Fould,
Laurent,
de Janze,
Soldcroup,
Progreaux,
Ducloux,
Limbouurg,
Pralon,
L. Charbonnel,
Baron d'Huart,
C. Frérichs,
R. de Labriolle.

GERMANY.

L. Roechling,
E. Schaltenbrand,
Aug. Thyssen,
Fritz Thyssen,
von Bodenhausen,
J. Muller,
M. Boecker,
B. Nothmann,
Gussmann,
S. Raetzer,
Dr. Léo Laval,
Burgers,
Rablenbeck,
Raache,
Kreuger,
Huschmann,
Dr. E. Schrödter,
Reusch,
Zillessen,
Fritz Baare.

HUNGARY.

Arrain von Biro,
Dr Paul von Biro.

RUSSIA.

Witmeur.

SPAIN.

le Comte de Zubiria.

The Lake Superior Ore Railroad Hearing

DULUTH, MINN., July 15, 1911.—In the case of L. E. Lum, of Duluth, against the Great Northern Railway, asking the Interstate Commerce Commission for a rate on iron ore from Grand Rapids, Mich., to Lake Superior, and suggesting 40 cents a ton as a reasonable charge, Commissioner B. H. Meyer, on July 11, continued the hearing until October. This was done that the commission might have opportunity to consider points adduced by the defense, chiefly the point suggested in this correspondence two weeks ago, when it was stated that the complainant had never offered any ore to the road for delivery on Lake Superior or elsewhere and on the further claim that other Minnesota iron ore carrying roads had not been made parties to the defense. As to the first contention Mr. Lum stated that he was interested in some 8,000,000 tons of ore near Grand Rapids, and that the reason why none had been offered the defendant was that the latter had never made a rate; and as to the second defense, he said that he would, if desired and necessary, amend his complaint before the continuance of the hearing.

Mr. Lum quoted rates of railroads running on lake ports from other ranges, saying that they were but half the Minnesota rate, and that in justice they should be receiving a higher proportionate rate than the Great Northern, on account of the fact that their equipment was not so economical in operation as that of the latter.

As to these claims, it is well to show the facts, and they are as follows:

	Miles.	Rate per ton.
Marquette range to Marquette.....	18 to 36	\$0.32
Marquette range to Escanaba.....	65 to 75	.40
Menominee range to Escanaba.....	42 to 60	.40
Gogebic range to Ashland.....	42 to 50	.40

While Mr. Lum's contention that the rate from other ranges to ports on the lakes, aside from Duluth-Superior, is 40 cents, is essentially correct, it does not bear analysis, for the rate per ton per mile is not greatly different from those from Minnesota ranges to Duluth-Superior, and it is not a question of absolute comparison of price from one terminal to another, but of the ton-mile rate. This is best shown as follows, considering the average length of haul from each range to its ports:

	Miles average haul.	Rate per ton.	Ton-mile rate.
Marquette range to Marquette.....	.25	\$0.32	\$0.0128
Marquette range to Escanaba.....	.70	.40	.0057
Monominee range to Escanaba.....	.50	.40	.0080
Gogebic range to Ashland.....	.45	.40	.0088
Mesaba range to Duluth (D.M. & N.R.R.)..	.77	.80	.0104
Mesaba range to Superior (G't Nort'n).....	.115	.80	.0070
Ely to Two Harbors.....	.94	1.00	.0106
Soudan to Two Harbors.....	.73	.90	.0123

It will be noticed that the highest rate of all given on iron ore on Lake Superior is that from Marquette range points to Marquette, while next to the lowest is that of the Great Northern Railway to Superior. The argument that Mesaba rates should be lower on account of better facilities can scarcely be taken seriously, even if true; and the matter of better facilities is to be considered in the light of information as to many outside conditions bearing on the question of haul. The writer is not trying to justify the 80-cent rate from Mesaba range points to Lake Superior, for it is doubtless very profitable, but the above facts are brought out merely to give opportunity for a dispassionate view of the entire situation. D. E. W.

The United States Steel Products Company has established a sales office in Toronto, Canada, under the management of Frederick C. Brunke, who has for a long time been connected with the Buffalo office of the Carnegie Steel Company. The United States Steel Products Company has been making its Canadian sales through the Buffalo office of the Carnegie Steel Company, but hereafter Ontario sales will be negotiated through its Toronto office, located at 220 King street, West.

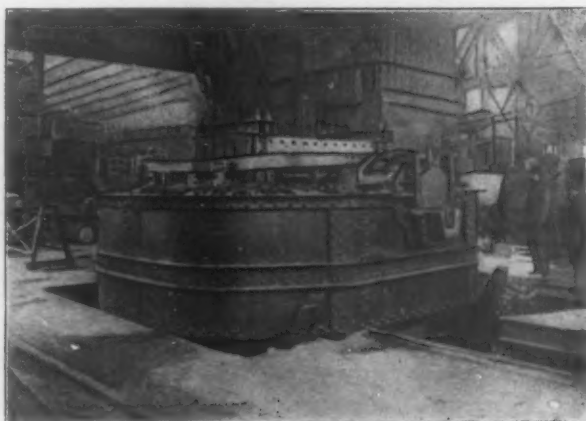
The Independent Bridge Company, North Side, Pittsburgh, Pa., builder of steel bridges and buildings and making a specialty of Government work, such as appliances for dams, has secured the contract for repairs to be made on the Seventeenth Street bridge over Wheeling Creek, at Wheeling, W. Va.

Steel Castings from Electric Furnace*

One Phase of the Practicability of the Roehling-Rodenhauser Induction Furnace

BY C. H. VOM BAUR†

The electric induction furnace for making steel has been in regular commercial operation in Europe for more than 10 years, and more than 30 of these furnaces are in regular commercial operation there. It has now been brought to the United States in its improved form, which permits sizes of 8 to 16 tons' capacity, and 30-ton furnaces have been projected. These electric furnaces are of the Röchling-Rodenhauser induction and resistance type, operating on single, two or three-phase alternating current, utilizing any convenient voltage of commercial cir-



Electric Induction Furnace, Showing Slag Removing Door.

cuits; 25-cycle is preferred, but 60-cycle current can be used in the smaller sizes.

The furnace action is similar to any ordinary transformer. The primary coil, receiving the incoming current, is subdivided into series of steps, usually five, which, by the aid of a switch, regulate the current and consequently the heat in the metal bath. The secondary current is mainly (70 per cent.) induced directly in the bath, which is really one short-circuited turn of the secondary winding of the transformer. The remaining energy, 30 per cent., is induced in a large copper bar secondary winding, wound directly over the primary winding, which latter receives the electric current from the alternator. This auxiliary secondary current is carried to two steel pole plates, set beneath the lining, one at each end of the bath. The magnesite lining covering these plates is the hearth of the furnace and becomes the conductor of electricity when red hot, acting similarly to the filament of a Nernst lamp in this respect.

The metal can be kept at any practicable temperature between a dull red and, say, 4700° deg. F. (which is the limiting temperature of the magnesite lining). As there is no involuntary change in the current, and no violent fluctuations take place, there is no strain placed on the prime mover. The furnace runs quietly and there are no carbon particles blowing through the air. The amount of steel in the furnace being known, the heat can, with a little practice, be accurately determined by observing the ammeter reading. No foreign ingredients can inadvertently get into the metal bath, like sulphur, phosphorus, carbon or substances from any flame, electrodes or lining, which fact makes the furnace most gratifying to operate.

Chemical composition and temperature can be regulated independently of each other. The composition of the metal can easily be changed and the temperature held at the desired point. The metal can be poured at the temperature to suit the conditions; for large castings, into crane ladles; for small castings, into bull ladles or small hand ladles. The furnace, being of the tilting variety, facilitates the pouring and the removing of the slag by the rear door.

When charging cold materials for making steel castings,

the cheapest steel scrap can be used to advantage and refined to the desired degree. The following makes a cheap and effective mixture:

Cost of Electric Steel per Ton, Material Charged Cold.	
¾ Bundled scrap at \$11.25 per ton.....	\$2.81
¼ Machine shop and heavy turnings at \$9.25 per ton.....	2.31
¼ Old steel rails at \$13.75.....	6.88
Total	\$12.00
Oxidation loss, 5 per cent.....	.60
Total	\$12.60

Electric current is being produced to-day for 0.6 cent per kilowatt hour with internal combustion engines, running on blast furnace, producer, natural gas or crude oil. The electric induction furnace provides a high load factor, operating, as it should, at full load for the greater part of the day. This continued operation insures this low cost for electricity.

The conversion cost per ton is, therefore, as follows (2-ton furnace with 280 to 300 kw., operated at Völklingen):

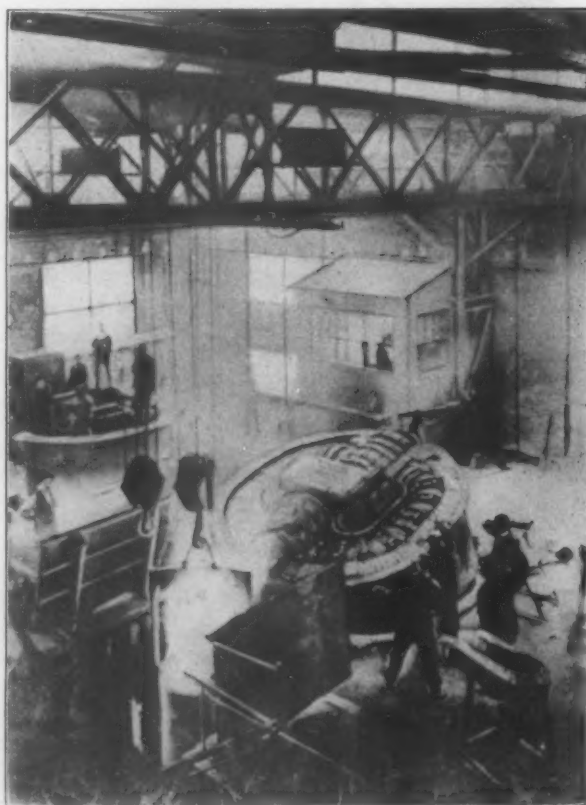
	Per Long Ton.
700 kw.-hr. for melting at 0.6 cent per kw.-hr.....	\$4.20
200 kw.-hr. for refining at 0.6 cent per kw.-hr.....	1.20
	\$5.40
Fluxes, etc.—roll scale 22 lb., lime 77 lb., fluor-spar 11 lb., sand 20 lb., ferro-manganese 8.8 lb.....	.44
Loss of fluxes owing to ¼ of all metal remaining in the hearth .....	.16
Labor, American equivalent, 2 to 3 men.....	1.50
Tools, repairs, and lining.....	.67
Depreciation 10 per cent., interest 5 per cent. on \$11,300—300 days, 6 tons a day*—\$1,695 ÷ 1,800 tons.....	.94
Auxiliary apparatus (cooling air for transformer).....	.04
Total	\$9.15

Adding this, we get:

Raw material.....	\$12.60
Conversion cost.....	9.15
Cost of one ton electric steel ready to pour.....	\$21.75

To this cost must be added a slight license fee per ton, depending on the output. The time of heat is about 4 to 4½ hr.

When charging hot metal for refining or merely for thorough deoxidation and segregation, it may come directly from the blast furnace, from a mixer, a cupola



Tapping the 4-Ton Electric Induction Furnace.

or some other furnace. At Dommeldingen very impure pig iron was charged into an induction furnace of the Röchling-Rodenhauser type and refined as shown in the table. Such impure hot metal is rarely charged in the elec-

*From a paper read before the recent meeting of the American Foundrymen's Association.

†American Electric Furnace Company, New York.

*12-hour day.

the furnace, except under unusual conditions, as it can be partly refined by a gas-fired furnace cheaper than in an electric furnace.

Results of Refining Pig Iron in Electric Furnace.

	Analysis of Charge. Per Cent.	Analysis of Cast. Per Cent.
Carbon	4.0	0.5
Phosphorus	1.8	0.025
Sulphur	0.2	0.03
Manganese	1.00	0.76
Silicon		0.056
Duration of conversion, 5 hours.		

Cost of Refining Hot Metal from Mixer

The cost of refining hot metal taken from the mixer at Dommeldingen, allowing for American conditions, is as follows for a 5-ton furnace:

Raw material.....	\$12.00
Oxidation loss 3 per cent.....	.36
	\$12.36
Current—280 kw.-hr. at 0.6 cent.....	1.68
Fluxes, etc.....	.60
Labor .....	.50
Tools, repairs, and lining.....	.64
Depreciation 10 per cent., interest 5 per cent. on \$17,000—300 days at 40 tons a day* = \$2,550 ÷ 12,000 tons.....	.22
Auxiliary apparatus.....	.06
Total	\$16.06
Cost of preliminary refining, about.....	3.00
Total cost of one ton of electric steel ready to pour.....	\$19.06
Time of each heat about 2½ hr.	

Cost of Refining Hot Metal from Cupola

The estimated cost of refining hot metal melted in the cupola, and consisting mainly of steel scrap, having about 2 per cent. carbon in the resultant mixture, is as follows:

Raw material.....	\$14.00
Total oxidation loss 8 per cent.....	1.12
	\$15.12
Conversion cost similar to the above.....	4.90
Cost of preliminary melt in cupola, about.....	3.00
Cost of one ton of electric steel ready to pour.....	\$23.02
Time of each heat about 3½ hr.	

Output with Hot and Cold Charges

Under ordinary conditions there is no very great difference in the total cost of hot metal ready to pour into the ladle, when charging either hot or cold material. The discrepancy is in the output. With a 5-ton furnace it is as follows:

	Per Month.	
	Single Turn Tons.	Double Turn Tons.
Cold charging.....	235	470
Hot charging.....	500	1,000

The electric current, and all the machinery it entails, does not enter largely in the total cost of a casting. It is usually not over ¼ cent a pound, or as little as 5 per cent. or even 2 per cent. of the selling cost of the finished

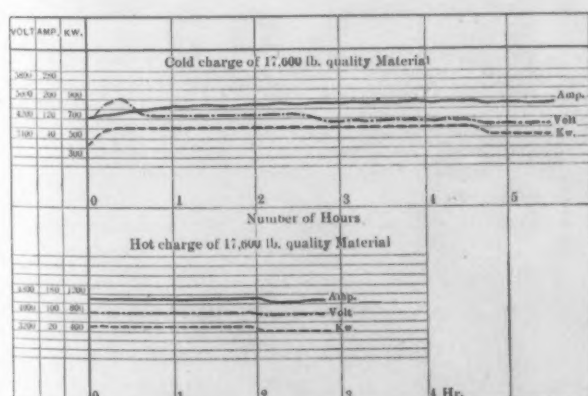


Diagram Showing Steady Consumption of Power in Röchling-Rodenhauser Electric Furnace

product. It follows that steel can be melted in the electric furnace for \$4.20 in a 2-ton furnace, and for about \$3.50 in an 8-ton furnace with electricity at 0.6 cent per kw.-hr. At the same time, though, the output is decreased by about one-half, as indicated above, for two reasons: 1. It takes longer to treat cold metal than hot. 2. We only pour three-quarters of the capacity of the furnace when charging cold material, instead of the total

*24-hour day.

contents of the furnace when treating hot material. When charging cold metal, a little of the hot charge remains in the furnace to complete the electrical circuit. Cold scrap being in many pieces, does not meet the conditions, as the voltage in the bath, being as low as 2 or 3 volts, is not sufficient to overcome the contact resistance between these many pieces.

Quality of Electric Steel

The metallurgical course of the process is very similar to that employed during the refining period in a basic open-hearth furnace. The limestone and roll scale are charged



Charging 4-Ton Furnace with Molten Metal. (Note Men Standing on Furnace.)

and the bath is then refined until the analysis shows that no phosphorus remains or the process may be stopped before this, thus retaining some phosphorus and cheapening the process. This refining usually lasts an hour or so, varying somewhat with the initial percentage of phosphorus present. During this dephosphorizing period the carbon is greatly reduced and the silicon entirely or almost entirely eliminated. This first slag is then thoroughly removed by tilting the furnace backward at a slight angle and rabbling off the slag. Then, according whether mild or hard steel is required, a quantity of carbon is added to meet the requirements. At this time sufficient ferro-manganese is charged to meet the specifications. The desulphurizing slag is then added. As soon as this is melted, the bath and slag are deoxidized, the slag becomes white, and, owing to the now increased temperature, absorbs the departing sulphur rapidly, the refining being dependent upon the temperature at the point of contact between the metal and the slag. The gases are now expelled and likewise the small particles of slag which are brought about by deoxidation; in the same manner the sulphides are absorbed by the white lime slag while a small part of the sulphides volatilizes; otherwise the composition of the bath remains the same. Carbon is then analyzed for and the necessary modifications made.

In the case of alloy steels, the alloys are only added after the deoxidation period, so that any loss which might be caused through the formation of slags is avoided. This deoxidation period usually lasts an hour. It is this deoxidation period, so thorough and effective, which has no parallel in any gas-fired furnace or converter. The sulphur has meanwhile almost entirely disappeared, getting as low as 0.01 per cent. to 0.005 per cent. After a last analysis shows that the deoxidation of the metal is complete, the furnace is tapped without any additions of any kind. Castings of any intricacy from ½ pound to the capacity of one or more furnaces are regularly made. In one of the works of Luxemburg, from which the following figures are taken, four grades of steel for castings have a call:

Four Grades of Steel Made at Luxemburg.

Grade.	Tensile Strength. Lbs. per Sq. In.	Elongation Per Cent.
a.....	56,900 to 64,000.....	25
b.....	64,000 to 71,000.....	20
c.....	71,000 to 83,400.....	15 to 18
d.....	85,400 to 99,600.....	8 to 10

For the electrical industry, a particularly soft steel of

the following analysis has a market: C, 0.05 to 0.06; Si, traces; Mn, 0.20; P, 0.005; S, 0.003.

Three pieces of equal weight, brightly polished, one of electric steel, one of open-hearth steel and one of Bessemer steel, of similar chemical analysis, were placed in an acid solution. Electric steel may lay claim to incontestable preference wherever materials have to be furnished to meet the strictest specifications in respect to resistance to acids and weather. It showed much less loss than the other kinds of steel.

Integral Cam Grinding Attachment

A new attachment for use on its plain and universal grinding machines which were illustrated in *The Iron Age*, April 21 and July 21, 1910, respectively, has been developed by the Landis Tool Company, Waynesboro, Pa. This device has been designed especially for grinding cams in place on their shafts, both made from the solid forging and of the built-up type. Fig. 1 is a front view of the attachment and Fig. 2 is an end view.

The attachment is constructed on the swinging principle, the main table being suspended from bearings on supports at the end. The work is held between the centers and the footstock is adjustable along the table for different lengths, the movement of the latter being controlled by the lever E, Fig. 1. It is a very easy matter to apply the attachment to the machine as all that is required is to clamp it to the table and remove the head and the footstocks, no other alteration in the machine being required. The work in addition to being carried on the centers is supported by adjustable steady rests on the shaft between the cams. These rests have detachable jaws which can be changed for different sizes of work and are adjusted by the screws D.

A special master is furnished with each attachment and is copied directly from the cams of a model shaft, which is fitted in the place of a master for this operation. This master cam is made from solid steel, thus eliminating any chance of the cams becoming loosened from the shaft, which would affect the tim-

Both of these parts are hardened, which makes them durable and assures the maintenance of the form of the master cam. The roller is in contact with the cam of the master corresponding to the one being ground, while the work of grinding is being done and is shifted along the machine table as the wheel is moved from one cam to another on the work. While this shifting operation is being performed the table is swung away from the wheel by pulling down the upright lever C, at the end, which disengages the master cam and swings the table so that the master cam will clear the roller while the latter is being shifted. The size of the roller corresponds to the size of the grinding wheel, which is used in grinding the master cam and is located in the same relation to the master cam as the grinding wheel is to the work.

Power for driving the attachment is secured by connecting the pulley at the end of the attachment by a belt to the countershaft of the machine. Provision is made in the work driving fixture for timing so that the cams will be ground in proper relation to the keyway or the flange.

The Youngstown Steel Company, Youngstown, Ohio, expects to blow out its blast furnace about August 1. During the shutdown it will be relined.

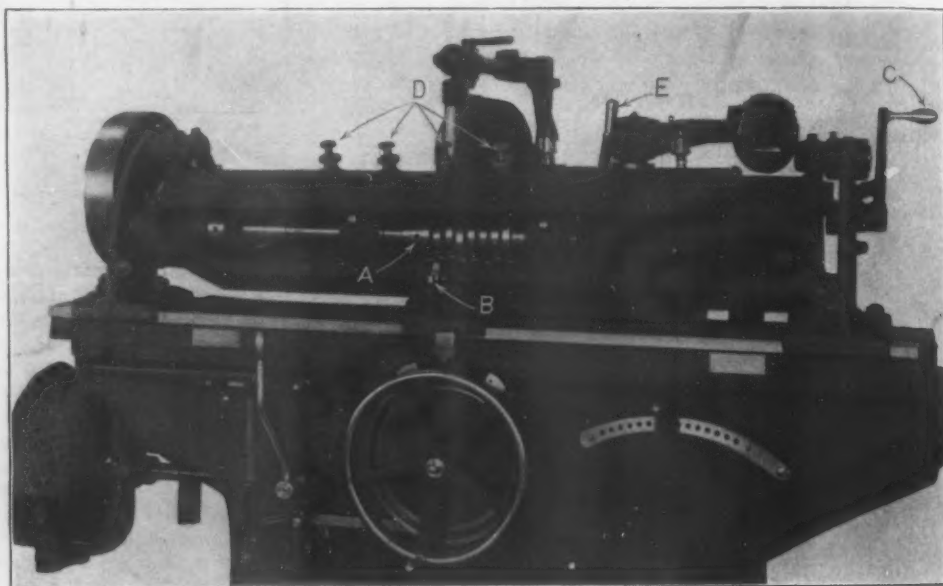


Fig. 1.—Front View of an Integral Cam Grinding Attachment for Use on Plain and Universal Grinding Machines Made by the Landis Tool Company, Waynesboro, Pa.

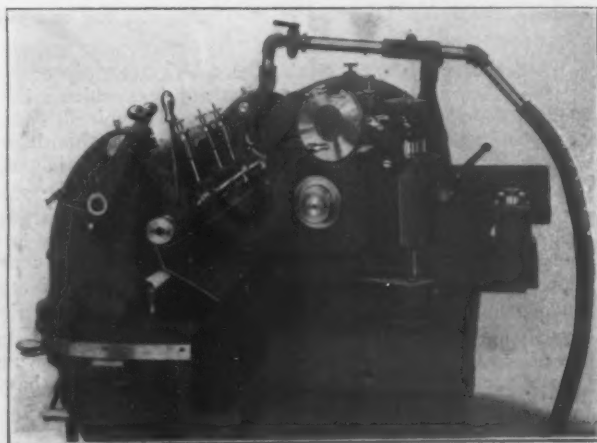


Fig. 2.—End View of the Attachment.

ing. This cam, which is shown at A, operates in contact with a roller, B, which gives the swinging motion to the table as the master revolves for forming and reproducing the cam shape on the work.

The committee appointed to examine the sale sheets of the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and the Highland Iron & Steel Company for the 60-day period ending June 30, 1911, found that the price for boiling and finishing mills for the months of July and August, 1911, will be based on a 1.25c. card rate scale of 1911-12, which entitles the puddlers to \$5.62½ a ton. The sheet and tin plate rates will be the base of scale.

Two New Fay & Scott Machines

The two new tools shown herewith, built by Fay & Scott, Dexter, Me., are a double end centering machine, designed for centering bar stock, and a heavy motor-driven face-plate lathe. The centering heads have renewable spindle bearings of bronze. The spindles, of hammered steel, have hand-lever feeds, through rack and pinion. The heads are pivoted so that by a slight tilting either the drill or the countersink is brought into centering position. The left-hand head is stationary, while the other is adjustable the entire length of the bed by rack and pinion. The chucks, which are self-centering, have hardened steel jaws which operate simultaneously by means of right- and left-hand screws. The chucks are adjustable to any required position.

The centering heads are driven through silent chain from a shaft which runs the length of the machine. The

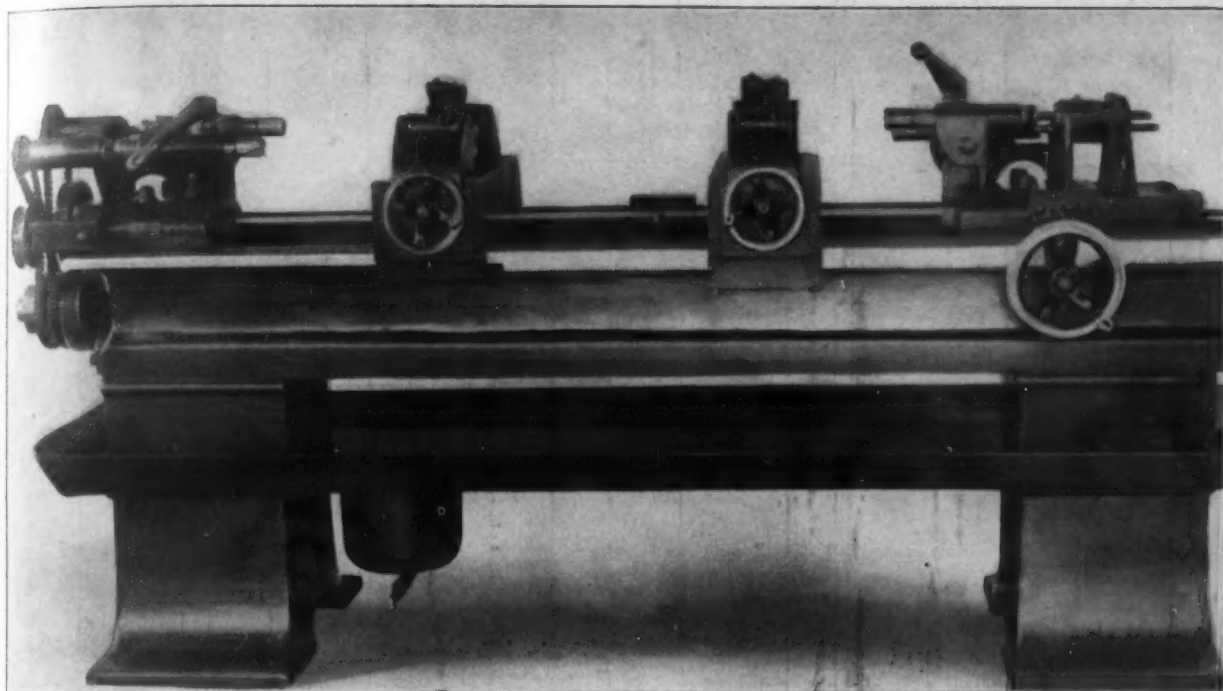


Fig. 1.—The Fay & Scott Double End Centering Machine.

bed is of the standard lathe type, and has a liberal number of box tiewards. The V's are 40 deg., with tops slightly rounded. The specifications of the machine are as follows:

Swings over bed.....	18 in.
Spindle bearings	1 1/4 by 9 in.
Spindles chucked, No. 2 Morse taper, drill spindle speed	425 r.p.m.
Countersink spindle speed.....	250 r.p.m.
Driving shaft diameter.....	1 1/2 in.
Maximum distance between drills, in table 10-ft. bed	60 in.
Chucks taking maximum diameter.....	6 in.
Driving shaft pulley.....	8 by 4 in.
Countershaft driving pulleys.....	12 by 4 in.
Countershaft speed	135 r.p.m.
Weight of 10-ft. machine.....	3500 lb.
Weight of bed, per ft.....	100 lb.

The large motor-driven face-plate lathe, shown in Fig. 2, is an improved type containing various refinements of design. The headstock spindle, driven by a variable speed motor, has speeds ranging from 22 to 1100 r.p.m. The machine swings 100 in. over the base plate and can take work 7 ft. between centers.

The General Fireproofing Company, Youngstown, Ohio, maker of all-steel furniture and filing equipment, expanded steel lath and other metal specialties, is arranging to double the capacity of its plant. The building will be of reinforced concrete and will cost about \$30,000. It is expected to be completed about October 1. Considerable new equipment will be installed.

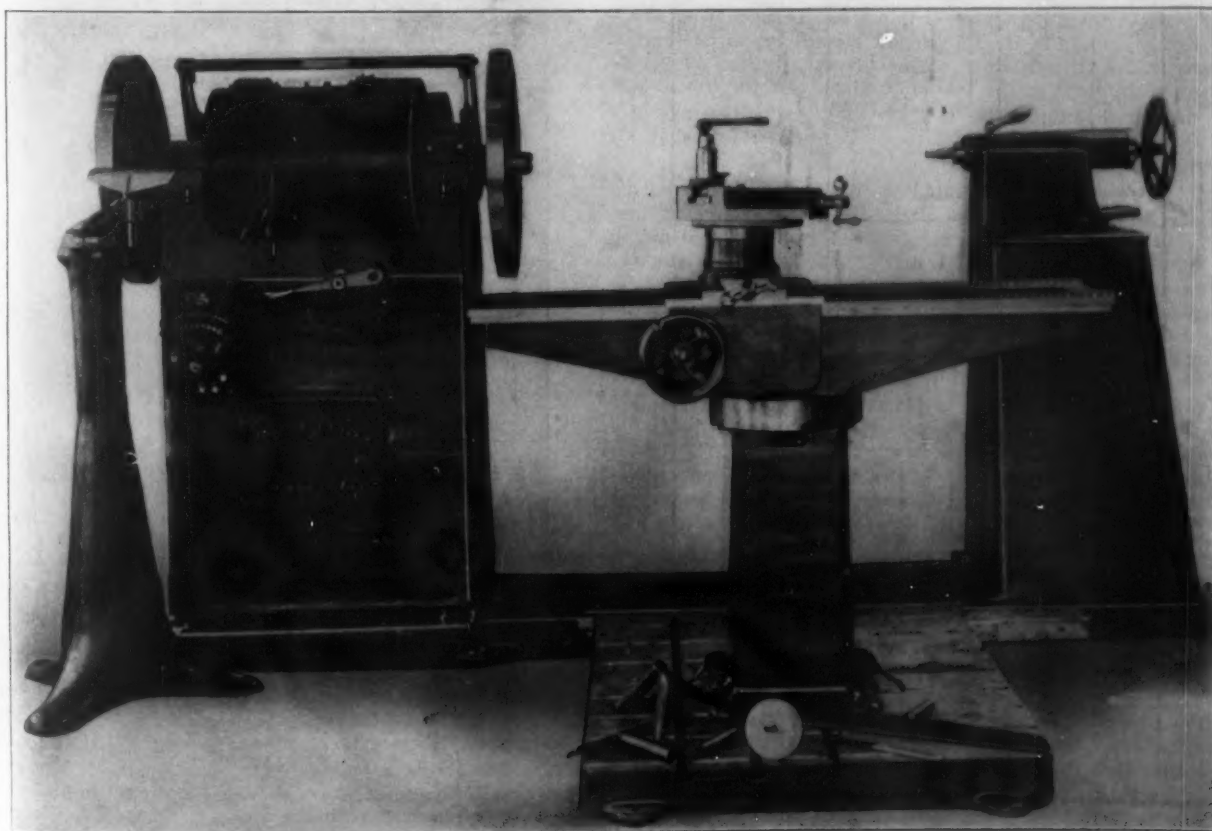
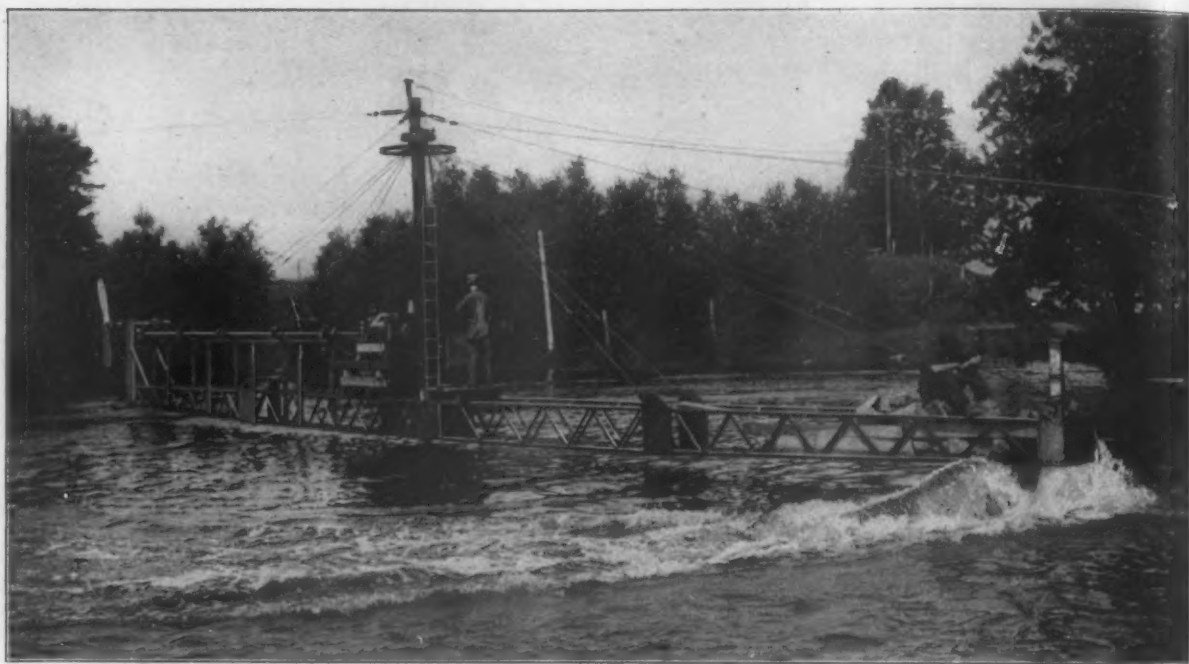


Fig. 2.—The Fay & Scott Motor-Driven Face Plate Lathe.

Aeroplane Propeller Testing Plant

One of the causes of breakdown and accident in aeroplanes is the faulty design of propellers. Generally speaking, little exact knowledge has been obtained of the various

Another subject of investigation will be the resistance met with by different shapes of blades in passing through the air. Pitot tube measurements will also be made to determine the variation and thrust from positions at the center of the shaft out to the tip of the propeller.



The Worcester Polytechnic Institute Aeroplane Propeller Testing Plant.

influences which must be taken into consideration before the propeller is perfected. The Worcester Polytechnic Institute, Worcester, Mass., has established an experimental station, the purpose of which is to carry out a long series of tests under conditions as they exist in working machines. The apparatus was designed by David L. Gallup, assistant professor of gas engineering at the institute. The station is located at Chaffin's, a suburb of Worcester, where are the institute's hydraulic engineering laboratories. The installation is seen in the photograph.

As a basis Professor Gallup took the apparatus which has been used in testing current meters. A large shaft is embedded in a boulder in the bottom of the lake which supplies water to the hydraulic plant. At the top of this shaft is a heavy boom, 84 ft. in length, which swings in a circle of 42 ft. radius, making a circumference of approximately 264 ft.

The propeller is mounted on one end of this boom, its axis being tangent to the circumference at that point, and is driven by a 75 hp. variable speed motor located at the center of the boom. At the present time the boom is turned on its axis by the action of the thrust exerted by the propeller, but later a supplementary motor will be installed which will drive the boom at a speed up to at least 60 miles per hour at the tip. The tip speed of the boom or the velocity of the propeller through the air is measured by means of a delicate electrical arrangement and is checked by a Warner speedometer which shows the speed in miles per hour.

Tests are to be run on various makes of propellers, determining the relation between "standing" thrust and "moving" thrust. That is to say, the propeller is to be anchored and the thrusts obtained for various speeds of rotation of the propeller. Then the propeller is to be operated at a definite number of revolutions per minute, say 1500, and various drags placed on the boom so that the speed of the propeller through the air will vary from 10 to 60 miles per hour. The propeller will next be run at 1400 r.p.m. and a sufficient drag placed on the boom to allow the propeller to go through the air at various rates of speed, and similarly for 1300, 1200, 1100 r.p.m., etc. Of course this performance will be varied in detail on account of varying pitches and diameters of the propellers which are undergoing test, but the instance cited serves as an illustration of the work which Professor Gallup plans to perform.

The Friedrich Changeable Open-Hearth Furnace Port

In a recent issue of *Stahl und Eisen* an illustrated description was given of the Friedrich changeable open-hearth furnace port, which has been adopted at a number of well-known plants, both within and outside of Germany.



Fig. 1.—The Port Ready for Putting in Place

It is controlled by the engineering concern, Poetter, G. m. b. H., Düsseldorf, Germany.

The change is completed in from 4½ to 5 hours, and the method of procedure may be seen in the accompanying illustrations. The valves are set so that the port to be changed is at the outgoing end of the furnace. The gas is shut off, the tie rods are removed and the roof of the air port is removed with the crane. The side walls are quickly broken down by a gang of men on each side of the furnace. Finally the whole removable part, resting on

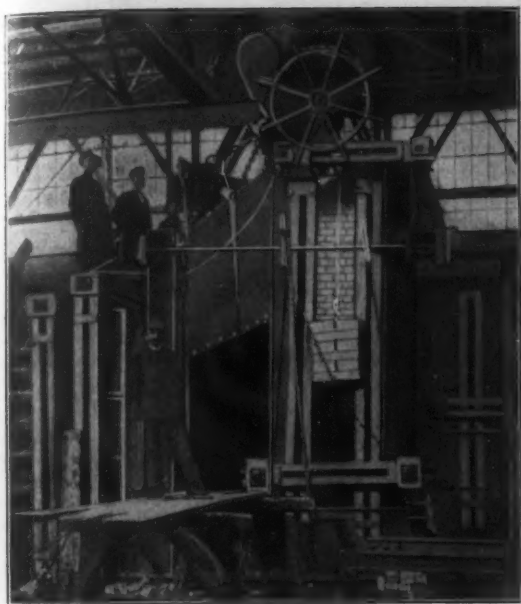


Fig. 2—During the Operation.

the cast steel plate is lifted and removed. The edges of the solid masonry are carefully smoothed and the new port is lowered into place.

Fig. 1 shows the construction and that this part only forms the bottom of the air port. Fig. 2 shows the operation. It has been found better to build up the side walls and back of the air port by hand, after the putting in place of the new port. After a little experience this can be done very quickly. In this way a very good connection is made with the fixed part of the ports, and a tight joint between the gas and air ports. Finally the roof is put in place, as may be seen in Fig. 3.

In many places only one gas port is now used, as shown in the right part of the drawing, Fig. 4. Opinions are divided on this procedure, but it has been successful in several places. One plant reports the following with the changeable port: "After 300 to 350 heats, the ports were changed. The second change came after a total of 550 to 650 heats. Several times a series of 1000 heats has been made with three changes before the whole furnace needed rebuilding."



Fig. 3.—Placing the Roof of the Air Port.

The weight of the changeable port for a 40-ton furnace is about nine tons. It has been successfully applied to small and large furnaces, being in use in one furnace of 3½-ton capacity. It permits of a saving in the original installation cost of the furnace and, through the shorter time necessary for repairs, gives an increased output; also, if the changes are made at the proper time, the rest of the furnace lasts much longer.

G. R. W.

G. B. W.

Electro Steel Company of Canada at Judicial Sale.—

Bids have been asked on the property of the Electro Steel Company of Canada, Ltd., by George W. Wells, K. C. Welland, Ont. Tenders will be received up to 4 p. m. September 5, 1911. The property consists of about 1 1-3 acres of land on which is located a main building, 75 x 165 ft., of concrete, with several additions and a store house. The equipment includes six generators, six transformers, motors, two traveling cranes, a rock crusher, etc. The property will be sold either in separate parcels or en bloc. The company, which has gone into liquidation, had for its object the reduction of iron ore by electricity.

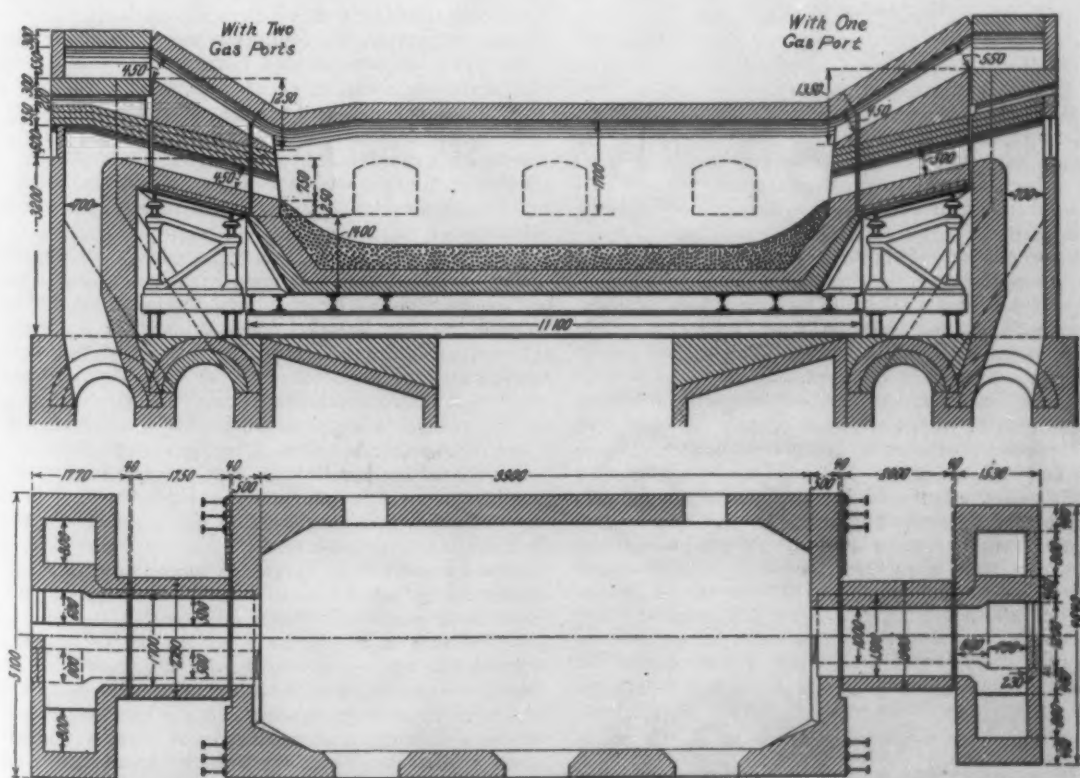


Fig. 4.—The Friedrich 50-ton Open-Hearth Furnace with Changeable Ports. Dimensions in Millimeters.

A Study of Steel Tires*

Scheme for Getting Test Specimens Without Impairing Value of Tires—Microphotographs for Specifications

BY ROBERT JOB AND MILTON L. HERSEY.†

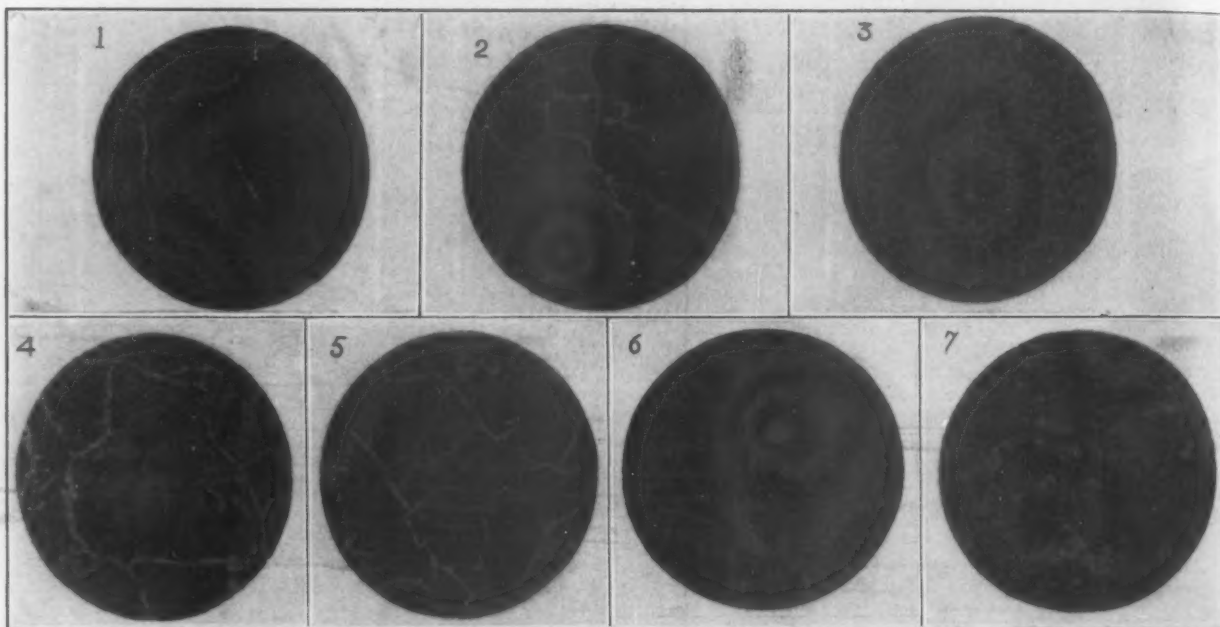
In general the practice has been to take a transverse full section of the tire, as near as possible to the point of fracture or failure, making careful scrutiny of the polished surface to detect any visible defect. The section was then etched to develop seam lines and similar defects. Meanwhile a standard test piece was cut from another portion of the tire and the usual tensile tests were made. A $\frac{3}{8}$ -in. section was next cut from the centre of the transverse section and polished and etched for microscopic investigation, and another similar section was

Fig. 1, which represents a tire which fractured in service, had this composition: Carbon 0.649 per cent., phosphorus 0.057 per cent., manganese 0.697 per cent., sulphur 0.039 per cent., silicon 0.100 per cent.

The huge size of the grain proves that the tire was finished at an excessively high temperature, and that it was ill adapted to meet even the more ordinary conditions of service.

Fig. 2 represents similar tire which also fractured in service. The size of grain is smaller, indicating a lower range of temperature, but the size is excessive and unquestionably a source of weakness. The composition was: Carbon 0.539 per cent., phosphorus 0.052 per cent., manganese 0.781 per cent., sulphur 0.032 per cent., silicon 0.254 per cent.

Fig. 3 has been taken from a tire which had been annealed. The granular form is fairly fine, although the structure is rather irregular. It represents, however, steel of far greater toughness and power of resistance to shock than Figs. 1 and 2 shown above.



Reproductions of Microphotographs at 50 Diameters of Parts of Steel Tires. Figs. 1 and 2, Center of Locomotive Tires Fractured in Service. Fig. 3, Center of Locomotive Tire Annealed. Fig. 4, Center of 0.53 Per Cent. Carbon Locomotive Tire. Fig. 5, Same Tire as Fig. 4, but $\frac{1}{2}$ in. from Surface. Fig. 6, Center of 0.83 Per Cent. Carbon Locomotive Tire. Fig. 7, Same Tire as Fig. 6, but $\frac{1}{2}$ in. from Surface.

taken from the transverse section, and microscopic examination was made of a face $\frac{1}{2}$ in. from the outside surface of the tire. Borings were also taken from the tire for analysis, the carbon being determined by direct combustion in a current of oxygen in an electric furnace. Photo-micrographs were taken at a magnification of 50 diameters to determine the size of grain, that magnification having been found the most satisfactory for the purpose. The hardness of the steel was determined with the Shore scleroscope.

A fair proportion of failures were due to radically defective composition, as, for instance, tires which contained over 1 per cent. carbon. The proportions of manganese, phosphorus and sulphur were generally within the usually accepted limits for tires. The carbon varied from 0.53 per cent. to 1.03 per cent.

In one case the metal had a tensile strength of 165,650 lb. per square inch, with elongation of 10.9 per cent. in 2 in., the proportion of carbon being 0.86 per cent., with granular size of about $\frac{1}{4}$ in. at fifty diameters. A marked difference was found between the tensile properties of test pieces taken longitudinally and those taken transversely from the same tire, as shown by the following:

	Tensile strength, lb. per sq. in.	Elongation in 2 in., per cent.	Per cent. carbon.
Longitudinal	157,000	9.3	0.795
Transverse	126,700	2.3	0.795
Longitudinal	150,000	11.0	0.77
Transverse	118,300	1.5	0.77

* From a paper read before the American Society for Testing Materials, Atlantic City, N. J., June 28.

† Mr. Job is vice-president, Milton-Hersey Company, Ltd., Montreal, Can.; Mr. Hersey is city analyst of Montreal.

In the examination of tires which had not been defective in service, we found the usual range in composition. The hardness tended toward the lower figures, as, for instance, about 42 to 47 deg., with carbon at about 0.70 to 0.80 per cent. and manganese at about 0.70 per cent. The granular structure in such tires was usually fairly fine with granules at 50 diameters about $\frac{1}{4}$ to $\frac{3}{8}$ in. diameter, though with the lower proportion of carbon, *e. g.*, 0.50 per cent., the metal was in some cases coarsely granular.

The failure of a tire may be caused by any one of many variables, both in composition and in physical properties, as well as by changes induced by conditions of service, as, for instance, by skidding. If a tough, fine-grained structure is secured by annealing the tires, the elastic limit of the steel is at the same time lowered and the tire is thus more liable to crush in service.

According to an account in the Proceedings of the New York Railroad Club December, 1906, it was found after 88 million tons' traffic that the annealed rails averaged 31.9 per cent. the more rapid wear and that they also showed the greater tendency to mash down and splinter, but we found then on test, that the elastic limit of the steel had been reduced from 80,600 lb. to 70,225 lb. per square inch, the carbon averaging 0.54 per cent. and manganese 1.06 per cent.

A section of a tire for a tensile test cannot be taken from a tire without rendering the latter unfit for service, but it is entirely feasible to take a section for microscopic work in such manner that the service value of the tire is not in the least impaired. A study of this section gives a clear idea as to the heat treatment which the tire has received at the mill.

In the first experiments sections were taken from the edge of the tire at a distance of $\frac{1}{4}$ in. from the surface, but it was quickly learned that such a section might not indicate the condition of the metal beyond the immediate surface of the tire. It was found that by taking the section at a depth of $\frac{1}{2}$ in. from the surface of the tire, a very clear indication as to the character of the granular form at the centre of the tire could be obtained, and the relative difference in size of grain, at the centre, and at $\frac{1}{2}$ in. from the surface of the same tire, is shown in Figs. 4 and 5, the former being at the centre of the tire, and the analysis as follows: Carbon 0.53 per cent., phosphorus 0.037 per cent., manganese 0.54 per cent., sulphur 0.030 per cent.

In Figs. 6 and 7 a similar example is given of a coarse-grained steel, Fig. 6 being from the centre of the tire and Fig. 7 from a point one-half inch from the surface. The composition was: Carbon 0.83 per cent., phosphorus 0.077 per cent., manganese 0.47 per cent., sulphur 0.049 per cent., silicon 0.21 per cent.

It was found also that a test section sufficiently large for the purpose could be obtained by boring into the tire with a hollow drill of special steel with walls not exceeding $\frac{1}{8}$ in. in thickness and having a core $\frac{1}{4}$ in. in diameter; thus the drill had an outside diameter not exceeding $\frac{1}{2}$ in. A hole slightly more than $\frac{1}{2}$ in. deep was then sunk into the tire, preferably from the inside, using screw cutting oil or compound, and the core was broken off with a small wedge, and the end filed off until the face was just $\frac{1}{2}$ in. from the surface of the tire. This small section of $\frac{1}{4}$ in. diameter was then polished, etched and photographed.

In drawing up specifications for the regulation of the heat treatment, it is simpler and far more satisfactory to make an engraving from a photomicrograph at 50 diameters showing the maximum size of grain which will be accepted, printing this cut as part of the specifications. The small $\frac{1}{2}$ in. test piece may also be used subsequently, if so desired, in making the hardness test with the scleroscope, provided a plane face is ground longitudinally on one side of the steel, using care to have this face exactly parallel with the opposite side at all points.

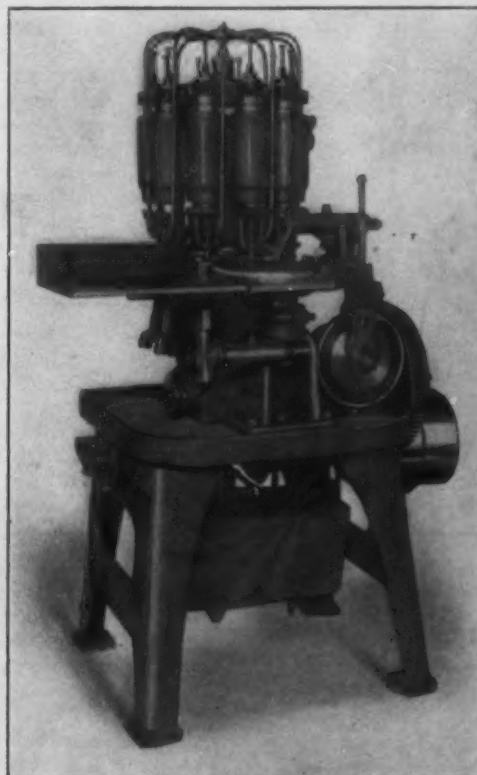
A Semi-Automatic Rivet Drilling Machine

For drilling the ends of different types of solid rivets, and especially those used in the tread of auto truck tire shoes, the Langelier Mfg. Company, Providence, R. I., has recently designed and built a semi-automatic machine. The main feature considered in its design was high productive capacity coupled with a low operating cost, as the machine was to be operated by cheap female help. This made it necessary to produce a machine that could be operated without requiring the services of high-priced skilled men, which were necessary to keep fully automatic machines in running condition, and as a result semi-automatic operation was decided upon. The drilling is carried on continuously without losing any time for inserting or ejecting rivets. The machine has ten spindles, nine of which are constantly at work while the other one is being loaded with rivets. The output desired was 50 soft steel rivets per minute drilled with a hole 0.17 in. in diameter and 7-32 in. deep, a condition that in continuous operation would probably have caused trouble if a fully automatic hopper feed had been used. For that reason a very simple and quick hand feed was substituted.

The machine consists of a one-piece column of ten drilling heads revolving at the rate of 5 r. p. m. around a central stationary upright post which is cast integral with the table. Each head has a drilling spindle running in a two-piece feed quill so constructed as to overcome the drilling pressure if hard rivets should be encountered, thus eliminating the stalling of the machine or breakage of the drills. At the top of the inner side of each of these feed quills a roll is located which is held in contact with a rim feed cam fastened to the top of the central post by a compression spring. It will be readily seen that the rim feed cam being stationary and the drilling heads revolving at a speed of 5 r. p. m., nine rivets will be drilled simultaneously or ten rivets for each revolution of the column, thus giving the required output of 50 per minute. For accommodating the machine to different depths of

holes and for taking up the wear of the drills, adjustments are provided at the top of the central column. This enables very minute regulation to be secured as the mechanism is in plain sight and readily accessible. To enable the machine to be used for drilling rivets of different lengths a vertical adjustment of the rim cam is provided.

Power for driving the drilling spindles is transmitted from the driving pulley shaft through bevel gearing to a vertical shaft running through the center of the central post. At the upper end of this shaft is located a common driving gear which engages ten fiber pinions, one for each spindle. The column is driven by a worm and worm gear, the worm shaft being connected to the pulley shaft through a pair of spur gears. For holding the rivets while the drilling operation is being performed each drilling head has an anvil and a clamping vise jaw. Bell crank levers, the lower end of which have a roll making contact with a stationary plate cam, open and close the vises at the proper time. This stationary plate cam is adjustable to enable the vise jaw to clamp rivets having different thicknesses of heads. A drill steady jig or rest is attached to the lower end of each feed quill and at the lower end of the jig there is a sliding bushing with a cupped end. This enables the rivets to be located accurately in a central position with respect to the drill and also provides lateral support for the drill during the drill-



A New Semi-Automatic Machine for Drilling Rivets Built by the Langelier Mfg. Company, Providence, R. I.

ing operation. The locating action takes place at the beginning of the downward feed of the drilling spindle and just prior to the clamping of the rivet by the vise. The former action causes the bushing to be pressed firmly over the rivet and the continued feed of the spindle does the drilling.

The rotary movement of a circular friction dial carries the rivets automatically to the vises and they are fed into them by a push finger. This finger derives its motion from a cam, the shaft of which is driven by the worm shaft through a pair of spiral gears. Storage space for a quantity of rivets is provided by a hardwood shelf placed at the level of the upper face of the dial. In this way it is possible to feed the rivets easily by having the operator push the blanks head downward on the dial. After the drilling operation is completed they are ejected by a stationary thin sheet steel finger which reaches into the opening of the vise and wipes the pieces out as they pass by.

The floor space required by the machine is 32 x 39 in. and the net weight is approximately 1600 lb.

Strength of Steel from Structural Shapes*

An Investigation Into the Effect of Overstraining by Gaggling and the Amelioration by a Period of Rest

BY E. L. HANCOCK,†

In rolling it seems reasonable to suppose that the web and flange of I-beams get more work done upon them than the root, and also that they are finished at a lower temperature. It would be expected, therefore, that the root metal would have a somewhat lower elastic limit than either the flange or the web, and that the web would have the highest elastic strength. This would be especially true in the thick heavy beams and much less true in the lighter thin beams where the work done upon the material is more nearly the same for different parts of the profile. That almost 50 per cent. of the beams reported should show results differing from what would naturally be expected challenges the attention, and one is led to investigate further the elastic strength of structural shapes.

During the present year tests have been made at the Worcester Polytechnic Institute under the direction of the writer to see if further reasons could be found for the irregularity observed in so many cases hitherto reported, and to account, if possible, for the rather low elastic limit in some cases. Nine stub ends of structural shapes were selected as follows: Three standard I-beams, 12, 15 and 18 in.; one 24-in. Bethlehem beam; three standard channels, 4, 12 and 15 in.; one 10-in. Bethlehem H section and one 6-in. angle. The details regarding these materials and the results of tests are given in Table I.

no variation. The Bethlehem beam section showed the relation of web, root, flange.

A determination of the carbon and manganese was obtained for three of these shapes, resulting as follows:

		Manganese.	Carbon.
4-in. 5.52-lb. channel.....	root	0.473	0.258
	web	0.428	0.160
15-in. 53-lb. channel.....	root	0.410	0.195
	web	0.467	0.205
24-in. 73-lb. Bethlehem I.....	root	0.628	0.151
	web	0.708	0.191

The rather high percentage of manganese in the Bethlehem beam may possibly account for the high elastic limit shown for the test pieces cut from it. The high values obtained for the 4-in. channel cannot be attributed to its chemical composition, but may be accounted for in part by the fact of the thinness of the metal.

Cold Bending of Beams in Straightening (Gagging)

After the beams and channels come from the hot rolls and are allowed to cool they become bent, due to the unequal cooling of the various parts. It becomes necessary, therefore, to straighten them while cold. This process is known as gagging, and often causes the mill scale to come off, causing what will be called "strain lines." The presence of these strain lines indicates that the metal has been overstrained in straightening. Overstrain in this connection is to be understood as meaning that the yield point of the metal has been reached in the portions of the beam where the strain lines appear. This falling off of the mill scale is seen in all tension tests of mild steel when the yield point is reached, providing the mill scale has not been previously removed.

The effect of overstraining iron and steel in tension upon the elastic properties has been investigated by Muir, the writer and others (Philosophical Magazine, June, 1907), and it has been found to have a very marked effect. It has been found that overstraining a piece in tension or compression reduces its elastic limit to zero or nearly zero

TABLE I.—Tests of Material of Various Structural Shapes.

Depth. Inches.	Beam Weight per ft., Lbs.	Specimen cut from	Elong- ation, in 8 in. %	Reduc- tion of area, %	Elastic limit, lbs. per sq. in.	Yield point, lbs.	Max. strength, lbs. per sq. in.	
12	I beam 31.5	Web	28	61.5	32,000	36,300	59,300	No strain lines.
		Flange	24.5	68.5	26,000	31,300	52,200	Strain lines
		Root	15	55	24,000	46,600	62,000	" "
15	I beam 60	Web	29	58	24,000	31,000	60,100	Pitted with rust
		Flange	26	59	24,000	32,000	62,500	" " "
		Root	28	57.3	24,000	31,900	60,000	" " "
18	I beam 55	Web	24	48.7	34,000	36,500	65,300	No strain lines
		Flange	30.5	63	30,000	33,800	61,200	" " "
		Root	28.5	55	26,000	32,200	60,700	" " "
24	Bethlehem I 73	Web	23.5	56.5	44,000	50,000	67,500	" " "
		Flange	27.5	62.3	38,000	42,000	62,600	" " "
		Root	25.5	61.2	40,000	42,000	64,200	" " "
2	Channel 5.25	Web	24.5	61.5	42,000	44,000	63,200	Heavy strain lines
		Flange	25	49.2	34,000	40,700	64,200	" " "
		Root	25	50.4	46,000	50,000	65,500	" " "
12	Channel 20.5	Web	27	58.5	34,000	41,600	63,200	No strain lines.
		Flange	24	58	34,000	43,800	65,300	Strain lines
		Root	21	55	40,000	51,500	66,000	" "
15	Channel 33	Web	26	63.7	24,000	35,900	56,500	No strain lines.
		Flange	28	59.3	28,000	32,200	60,300	" " "
		Root	27	65.7	32,000	35,800	59,500	" " "
6	Angle 21.9	Web-1	27	59.6	34,000	39,000	58,300	" " "
		Root	24	53	34,000	38,600	62,900	" " "
		Web-2	30	63.3	34,000	34,200	54,200	" " "
10	Bethlehem H 88.5	Web	31	50	26,000	31,600	53,800	" " "
		Flange	36	53	20,000	28,500	52,200	" " "
		Root	31	51	18,000	26,000	53,100	" " "

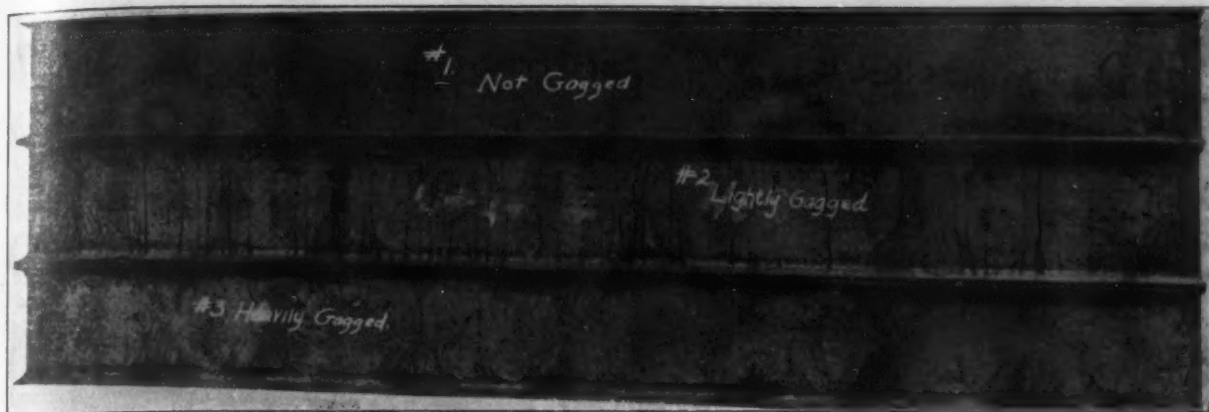
It is seen from this table that out of the nine structural shapes investigated only three give the relation web, flange, root. The heavy beam 15 in. 60 lb. shows no variation between web, root or flange. The channels all give a higher value for the root and about the same for the web and flange, except in the case of the small 4-in. channel, where the web is considerably above the flange. In considering the results of tests of these channels it should be noticed that they are all rather light sections and that in any case the root of a channel received much more work in rolling than the root of an I-beam. The angle showed

(depending upon how much of the yield at the yield point was developed before releasing the load. After a sufficient rest, varying from a few hours to 8 or 10 days, according to the kind of material, the elastic limit gradually returns and reaches a value somewhat higher than the original. Since beams are straightened cold at the mills, as indicated by the strain lines, it occurred to the writer that this might be a cause for the low values obtained for the elastic limit in some cases and the high or irregular values in others.

The occurrence of the strain lines indicates that the material has been overstrained. It should then be expected that it would follow, if possible, the same laws that govern overstrained tension test pieces, namely: That its elastic limit would be reduced to zero or nearly so; that subsequent rest would bring this elastic limit back to and even

*From a paper read before the American Society for Testing Materials, Atlantic City, N. J., June 30.

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Three Beams, Showing Strain Lines Due to Overstraining

above its original value. It seems reasonable to suppose, however, that the recovery will not be as rapid in a beam as in a single test piece; that it will be more rapid in small or thin beams than in large or thick beams; that it will be retarded by the presence of adjacent material that has not been overstrained. This latter supposition will be made clearer by referring to the engraving. This photograph shows three 10-in. 25-lb. I-beams as they were received from the mill. No. 1 is marked as "not gagged," but it shows strain lines all along both flanges, indicating that it had been straightened. No. 2 was "lightly gagged" and No. 3 "heavily gagged." The depth of the strain lines on the web indicates the spots where the overstraining was most severe. These overstrained portions and the adjacent portion not overstrained indicate that there must be internal stresses in the beam and that recovery from overstrain might be considerably retarded by these stresses.

In selecting the material from which the tests of Table 1 were made, particular attention was paid as to the evidence of overstrain in the portion of the beam by observing the presence or absence of strain lines. The last column gives a record of these observations. Examining this table with this information in mind we observe that in the case of the 12-in. beam the web shows no evidence of overstrain, while the flange and root show such evidence. The results for the elastic limit would be entirely consistent with the above observations as well as with the idea of the amount of work done in rolling.

The 15-in. beam was so pitted with rust that all strain lines, had they ever existed, must long since have been obliterated. There is no variation in the elastic limit, and since this is a thick heavy beam a very high elastic limit would not be expected. A difference due to work in rolling might be expected, however. No strain lines are shown on the 18-in. beam, and the values obtained for the elastic limits are explainable on the idea of work in rolling. The Bethlehem beam, 24-in., showed no strain lines, and the values for the elastic limit of root and flange are so nearly equal as to call for no particular discussion. The 4-in. channel was evidently heavily gagged, and the high values obtained for the elastic limit may be attributed to the complete recovery from the overstrain. That the root is so much higher than the other portions may be due to a greater amount of work in rolling. In the 12-in. channel there seems to have been complete recovery from the overstrain, while in the 15-in. channel and the angle there was no sign of overstrain.

The 10-in. Bethlehem H section was selected as a type of heavy section, the flange being 1 in. thick. This particular section had been in storage two years, so that all strain lines had disappeared, and the metal should have recovered its normal elastic properties. It is believed that the values found for the elastic limit for these pieces are low because of the small amount of work done in rolling and the comparatively high finishing temperatures.

An attempt was made to test the three beams shown in the half-tone engraving as beams by supporting them at the ends and loading them at the middle. The results of the tests were not satisfactory since the beams yielded on account of lack of side restraint. An 18-in. length was cut from the middle of each beam and from the left-hand end. Test pieces were cut from the compression flange and root and from the center of the web. These were tested in tension and the results are shown in Table 2.

It is presumed that the end sections of the beam (E) were so slightly stressed that the elastic properties in tension were not appreciably changed. The test pieces cut from the ends E should then show the strength of the metal from beams 1, 2 and 3, irrespective of the bending tests.

The time intervening between the gagging of the beams and the cutting of the sections was about three months, and the tests were made about a month later. The beams were thin and light and the material probably had sufficient time to recover from the overstrain due to gagging before the tension tests were made. This view is confirmed by the values of the elastic limit for the E pieces given in Table 2.

TABLE 2.—Results of Tests of Pieces cut from 10-in. 25-lb. Standard Beams.

Test-Piece.	Elongation in 8-in. %	Reduction of area %	Elastic limit lb. per sq. in.	Yield point lb. per sq. in.	Tensile strength lb. per sq. in.
1 E W	30	62.2	32,000	36,600	57,700
2 E W	32	60	32,000	36,200	58,100
3 E W	29.5	58	32,000	36,000	58,400
1 E F	30	64.2	28,000	33,100	57,800
2 E F	25.5	62.3	20,000	30,900	58,000
3 E F	26	60.2	24,000	33,400	58,600
1 E R	30	62.5	28,000	33,500	58,000
2 E R	25.5	58	20,000	33,300	59,100
3 E R	23.5	63	28,000	32,000	59,200
1 C W	29.5	66	30,000	35,600	53,300
2 C W	30	63.3	30,000	35,200	57,700
3 C W	29.5	62.8	28,000	35,100	59,500
1 C F	29	58.7	16,000	32,200	58,100
2 C F	25	60	28,000	31,800	58,300
3 C F	22	62	14,000	35,700	58,200
1 C R	..	62.8	14,000	29,500	57,200
2 C R	24.5	58.7	22,000	37,600	60,000
3 C R	22	61.2	16,000	38,300	59,750

NOTE.—Nos. 1, 2 and 3 refer to the beams Fig. 2. E refers to the end portion and C to the center portion. W, F and R refer to web, flange and root.

The sections C were overstrained in the testing machine about one month before being tested in tension. Beam 2 was not overstrained quite as much as beams 1 and 3. The effect of this overstraining is shown in the low values obtained for the elastic limit of the flange and root pieces. It is believed that this overstrain reproduces very closely the same effect as the gagging at the mill and the tension tests show that even after the lapse of three or four weeks the material has not regained its original elastic strength. The great difference between the elastic limit and yield point should also be noted. The similarity of the low elastic limit occurring with the normal yield point in the root and flange pieces of C to those obtained by Professor Marburg (Proceedings 1909, p. 385) suggests a probable similarity of cause. That is it seems reasonable to suppose that portions of his beams from which test pieces were obtained had been recently gagged.

Test pieces were cut from the other side of the compression flange of the C sections. These were heated to about 1600 deg. F. and allowed to cool slowly. They were then finished and tested. The results are as follows:

Test-Piece.	Elastic limit after heating.	Elastic limit other side of flange untreated.
1 C F	24,000	16,000
2 C F	24,000	28,000
3 C F	26,000	14,000

The results show a considerably higher elastic limit after treatment for the pieces from beams 1 and 3, as would be expected if the low values were caused by overstrain. Test pieces 2 C F show little variation.

To determine whether or not the results of tests

obtained by the writer last year could be checked this year by testing pieces from the opposite root and flange (most of these had been saved), test pieces were prepared from the opposite root and flange of beams H (15 in. 60 lb.) and K (20 in. 65 lb.). The results of these tests are shown below:

Tests to Show Value of Rest on Elastic Limit.

Test-Piece.	Beam	Elastic limit obtained 1910	Elastic limit obtained 1911 from opposite flange and root
15-in. 60-lb.	Flange	22,500	28,000
	Root	13,500	22,000
20-in. 65-lb.	Flange	24,000	26,000
	Root	16,500	24,000

This seems to indicate a recovery of the elastic limit, although there was at this time (1911) no evidence of strain lines on either of these beam sections. The expense of the preparation of the test pieces has made impossible the testing of pieces from the remaining sections investigated in 1910, although most of these sections have been stored for safe keeping.

Further tests were made upon material from an 18-in. 55-lb. standard beam to determine the effect of gagging. One section of the beam was heavily gagged and another section not gagged at all. From these test pieces were cut from the root and web and tested as soon as possible (within a month of the time of gagging). The results are as follows:

Tests of Material of Heavily Gagged 18-in. Beam.

Test-Piece	Treatment.	Elongation 8-in.	Reduction of area	Elastic limit lb. per sq. in.	Yield point lb. per sq. in.	Tensile strength lb. per sq. in.
Web	gagged	23	57	20,000	32,800	60,100
Web	gagged	28.5	59	18,000	30,600	59,000
Root	gagged	20.5	56	22,000	36,600	61,100
Root	gagged	26	50	18,000	36,100	62,000
Web	not gagged	30	55	28,000	33,300	58,700
Web	not gagged	28	56	30,000	34,000	59,000
Root	not gagged	28.5	56	26,000	33,100	59,700
Root	not gagged	30	55	24,000	32,000	60,500

The average value of the elastic limit for the gagged pieces is 19,500 and that for the pieces not gagged, 27,000.

All the evidence seems to show that overstraining a beam lowers the elastic limit of the metal in the beam temporarily, but that this elastic limit returns after a period of rest, the time at which the normal elastic limit has again been reached depending upon the amount of overstrain, the size of the beam (height and thickness) and probably somewhat upon the chemical composition of the material. From the few tests made the statement might be made that the time necessary for complete recovery varies from three months to a year for beams from 10 in. to 20 in.

It has been noticed that nearly all the finished test pieces were slightly bent, due, supposedly, to the internal stresses, and an attempt was made to find some relation between the condition of the test piece as to bending and its elastic limit. With the Ewing extensometer used in making the recent tests this bending due to internal stresses does not seem to affect the results. It was noticed that the pieces that were annealed before finishing (1 CF, 2 CF and 3 CF) showed no signs of bending.

Conclusions

The review of the tests thus far made on steel cut from different parts of the profile of structural shapes and a study of the conditions of manufacture of such shapes leads to the following conclusions:

1—That the tensile strength, per cent. of elongation and per cent. of reduction of area are practically not affected by chemical composition or treatment during or after rolling; that the yield point is affected but slightly; that the elastic limit is affected, but not seriously, when the proper precautions are taken.

2—The chemical composition of open-hearth beams is so uniform throughout the beam as to cause no practical difference in the strength of metal cut from different parts of the profile of the beam.

3—If all parts of the profile of a beam were finished at the same temperature it would be expected that the root of the web would have a slightly lower elastic limit than the center of the web or the flange because of the smaller amount of work done upon it in rolling. But the flange and web, being thinner, are finished at a slightly lower temperature than the root, and so have their elastic strength increased still more, due to this lower temperature. The web probably received more work than the flange in rolling.

4—Overstraining structural shapes lowers the elastic limit of the metal, but not permanently.

New Portable Electric Drills

Some Recent Products of the Van Dorn & Dutton Company

A new line of electrically operated portable drills and reamers has recently been brought out by the Van Dorn & Dutton Company, Cleveland, Ohio. Several changes in design and various improvements over the Hard Service line formerly made by this company have been embodied in their construction, although the only claims made by the maker are marked improvements in the construction both electrically and mechanically considered rather than anything radically new. The special features claimed for these tools are durability, simplicity in construction, reliable operation, ability to withstand long continuous service, the lightest possible weight that is consistent with the power developed and the minimum amount of repairs. Eight types of machines go to make up the new line, six of which have a capacity for drilling

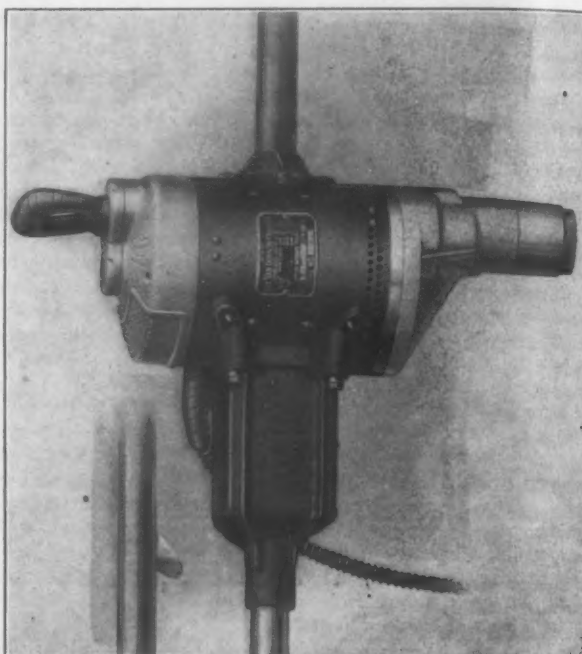


Fig. 1.—The New Type DC-3 Portable Electric Drill, Made by the Van Dorn & Dutton Company, Cleveland, Ohio.

holes from 0 to 2 in. in diameter for operation on direct current circuits of either 110 or 220 volts and two sizes with a drilling capacity up to $\frac{3}{8}$ in. for operation on either direct or alternating current circuits of the same voltages. Figs. 1, 2 and 3 show three of the direct current machines having maximum drilling capacities of $1\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ in. respectively, while Fig. 4 illustrates the smaller size of the universal drill.

Series motors developing the greatest amount of power obtainable for the size and weight are used. In the larger machines four pole motors are employed, while those of the smaller are of the bi-polar type. The design is such that the harder the tool is forced the greater is the torque developed. The armature is of the slotted drum type and is built up of special analysis soft steel laminations on a hollow shaft, each disk being uniformly insulated. The armature and the field coils are form wound with insulated soft copper wire and all insulated parts are subjected to a very high voltage test.

In the larger machines the field frames are constructed of sheet steel, while in the smaller tools this part is built up of laminations in a manner which is very similar to the construction of the armature. This construction gives great rigidity with light weight. By removing the screws that hold the bottom head and the armature and plate, all interior parts and connections are readily accessible. The larger sizes have a removable socket or adapter set into the spindle which enables the tool to be removed quickly without using a drift. The lower head and the gear case which are reinforced with ribs to prevent distortion are made of cast aluminum.

Special attention has been given to the matter of lubri-

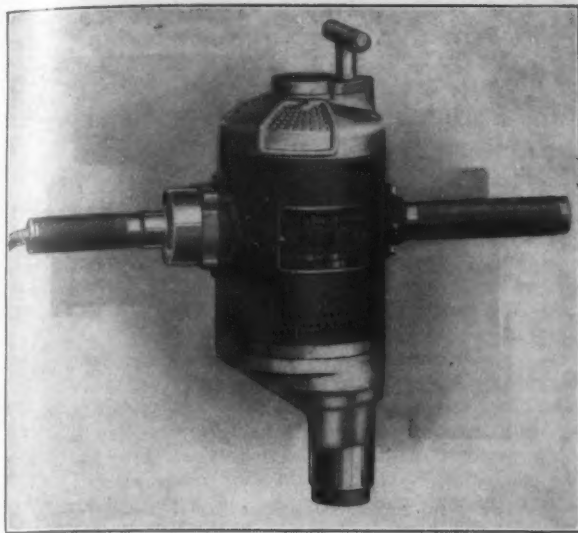


Fig. 2.—A Portable Direct Current Tool for Drilling $\frac{1}{4}$ -In. Holes in Steel.

cation and the bearings in designing these drills, as they are two features which are of great importance in tools of this character. A simple but very effective method of lubrication has been adopted. The gears are inclosed in a case which is entirely separate from the windings and not only serves as a housing for the gears, but also as a lubricant chamber for the gears themselves and the spindle and the thrust bearings. Channels running from this case to the bearings enable all of them with the exception of that supporting the spindle to be lubricated while this one is provided with an easily accessible receptacle. The motion of the gears forces the lubricant through these channels, thus assuring proper and sufficient lubrication at all times. The oiling system is so designed that one charge of non-fluid oil, it is claimed, will answer for several weeks. Ordinary machine oil can be used for lubricating the spindle. The wipe system is employed for this part, and it is so arranged that the wick is constantly in contact with the spindle. In designing the bearings an ample factor of safety was allowed, and it is claimed that friction has been reduced to a minimum. For the high speed members imported ball bearings are used, while elephant bronze bushings are used as bearings for the slower speed members.

All of the gears used in the tool are made from an alloy steel and are hardened and ground to size to secure great strength and long wearing qualities. The teeth forms are all accurately generated. The spindle and the socket are of a special design which is said to eliminate slipping and breaking, and these parts are made of a special grade of steel which is hardened and ground. A

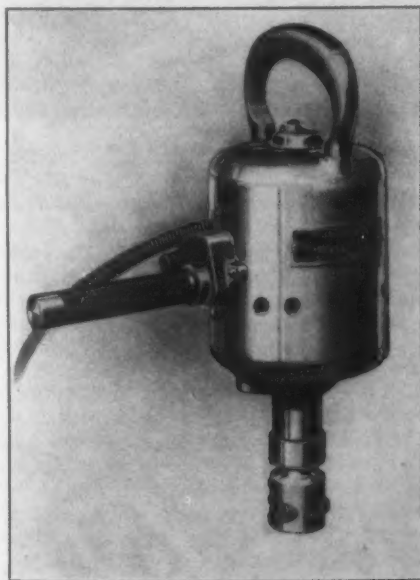


Fig. 3.—The Smallest Size of Drill Made, Maximum Capacity, $\frac{1}{4}$ -In. Holes in Steel.

fan having sufficient capacity to keep the motor cool is provided with the drill and this is of a special design supported at the top and the bottom by a rim which gives it strength. The heated air is forced out by the fan and is replaced by cold air which is drawn in by suction.

A quick-break switch having a capacity of 50 per cent. in excess of that required is employed. In the larger machines, which are also used for reaming, mechanically operated automatic switches are used that will stop the drill if the operator should accidentally release the handle when the tool is in operation. These switches will break instantaneously, thus eliminating a very heavy and destructive arcing, while in the smaller machines a special design of switch is employed in which the contacts are designed so as to be readily replaced at a low cost. The brush holder is well insulated and direct connection is secured from the brush to the terminal block by leads. The brushes can be readily removed, although they are firmly held in place. In general, the construction of this line is such that the tools are easily assembled and

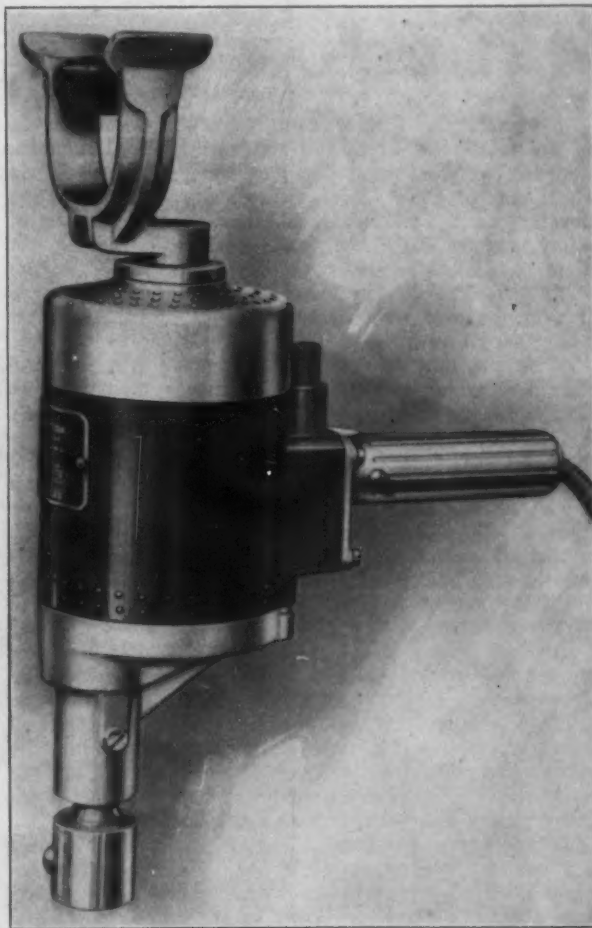


Fig. 4.—The Type DA-00 Universal Drill.

taken apart and all parts are interchangeable and easily accessible.

The sizes and capacities of the eight types of machines are given in the following table, the first six being for direct current only and the last two for either direct or alternating current:

Type.	Drilling capacity, in.	Reaming capacity, in.	Weight, lb.	Height, in.
DC-4	2	1 1/4	83	20 3/4
DC-3	1 1/4	1 3/16	54	17 1/2
DC-2	3/4	1 1/16	30	14
DC-1	1/2	7/16	20	13
DC-0	3/8		14	12 3/4
DC-00	3/8		6 1/2	9 3/4
DA-0	3/8		14	12 3/4
DA-00	3/8		7	10 3/4

The height measurement given in the last column of the foregoing table is made from the top of the head cover to the end of the spindle or chuck, as the case may be. The first three machines are not equipped with a chuck, but the five remaining sizes can be equipped with either a chuck or a spindle. When the machine is equipped with a chuck the height measurement is increased by 1 1/2 in.

Standards of Safety in Relation to Machinery*—II.

The System of the United States Steel Corporation in Ridding Works of Their Dangers— The Problems That Have Been Solved

BY DAVID S. BEYER.†

The Human Factor

A large percentage of our industrial accidents can be attributed to carelessness, indifference, willingness to take chances—the same fundamental human failings and shortcomings that are found in the office and the home as well as in the mill. Rudyard Kipling has recognized the universal nature of our human characteristics and expresses it in the following lines:

"Who shall doubt the secret hid
Under Cheop's pyramid
Is that the contractor did
Cheops out of several millions;
Or that Joseph's sudden rise
To Controller of Supplies
Was a fraud of monstrous size
On King Pharaoh's swart civilians."

I venture the further surmise that if we could dig up the tablets on which the accidents of that day were recorded, we would find that men were suffocated in the wheat bins of Egypt, just as they are in Chicago's grain elevators; and I do not doubt that if the wearing of safety goggles had been made compulsory among the stone masons who built the pyramids these goggles would often have been found on the foreheads instead of over the eyes they were intended to protect—just as I have seen them in a modern steel foundry.

With the development of the complex and powerful machinery which is used in our modern industries, we have added an additional and magnified element of risk, that is lacking in the more simple and fundamental occupations. The men who hurriedly jostles against his neighbor in the street may do so with impunity, but it is a different matter when a steam engine or an electric crane is substituted for the passer-by. In the steady, rhythmical motion of a large machine one readily forgets the 1000 hp. of energy back of it, in comparison with which the human body is as insignificant as a pebble to the steam roller.

It is not strange that a man who has worked day after day for several years in a blast-furnace plant, without any inconvenience, should forget that the colorless, odorless gas which is present in greater or less degree at all times can deprive him of his senses, or even of his life, without any perceptible warning—if he happens to breathe too much of it. It takes a tragedy to bring this home to his consciousness, and even then the effect soon wears off.

I have in mind a plant where several men have died as a result of being overcome by gas. The most recent accident involved a man who had had several years' experience about the plant and knew of the former accidents. He was on duty in a motor house near the gas washer. There were no gas mains or direct connections to the little building in which he was located, and the work was so light that one man could easily have taken care of it. As a special precaution, however, an extra man was always employed at night so that a single person would not be left alone where he might be overcome by gas without anyone knowing about it.

One night the motors were shut down for a few hours and these two men had some idle time on their hands. They locked the doors of their house on the inside so that they would not be disturbed and one of them made a bed of waste back of the switchboard, lay down and went to sleep. The other one sat in a chair, but he, too must have become drowsy and did not notice that the water had escaped from a valve outside the building and that gas was leaking in through openings in the walls. When the doors were broken open a short time afterward both men were dead.

You may say that this is an extreme case—and so it is—but examples of similar short-sightedness are constantly coming to our attention, and I could multiply them

indefinitely. Frequently, as in this instance, it is the man who is careless who has to pay the penalty—but fortunately the penalty is not often as severe as it was in the case I have described.

An accident recently occurred where the foreman in charge of a boiler house opened a valve and allowed hot water and steam to blow into the ash pit of a boiler, seriously scalding one of his helpers, who had told him a few minutes before that he was going into this pit to do some work. Not more than six months ago I talked to this foreman about carrying out a rule in regard to locking valves for the protection of men under similar conditions, and he scouted the idea that he might ever make such a mistake.

Take the case of hammering tools used by blacksmiths. Almost every man who has worked at this trade for any length of time has scars, or even pieces of steel imbedded in his body, caused by allowing his tools to become "mush-roomed" over at the edges, so that pieces break from them and fly. Such a piece may knock out an eye and leave him partially blind for the rest of his life. The danger can be



A Warning Against High Tension Electric Currents, Understandable in Many Languages

eliminated if he keeps his tools properly dressed, and yet a shop where every tool is in good condition is a rarity. Even with the system we have in vogue, where an inspector goes through each shop weekly and reports defective tools, something of the same condition is found, though in a greatly lessened degree.

Printed Rules and Warnings

It is possible to issue rules and instructions covering certain specific dangers. For instance, we tell the workman that he must not oil, or wipe, or adjust, his machine while it is running, and in order to keep this before his mind we post signs in conspicuous places throughout the mill on which this rule is displayed. We tell the crane operator that he must not leave his cage and go on top of the crane without locking a switch so that no one can throw on the power and catch him unawares, and this, together with a number of other safety precautions, is printed and posted in his cage where it is always before

*Paper presented before the National Conference of Charities and Correction, Boston, June 13, 1911.

†Chief Safety Inspector of the American Steel & Wire Company.

him. We place on high voltage electric equipment a red and black marked sign with a white skull and cross bones and the one significant word "Electrika," which is universally understood in all languages.

Such precautions can be taken where a certain definite and specific risk is involved, but anyone who has made a detailed study of accidents must be impressed with the large percentage of them which are due to some unusual condition or some peculiar combination of circumstances that could not possibly be foreseen and covered by general instructions.

For instance, the case I have just cited of the man who was scalded in the ash pit would not have occurred if one of the connections to a grate bar had not suddenly given way. It was in an effort to fix it that the injured man crawled into the pit, where he worked with a bed of hot coals directly over his head. One would naturally not expect a man to be in such a location, so the knowledge that he was there escaped the mind of the foreman at the critical moment, even though he had been properly informed of it.

So much depends on the exercise of judgment and thoughtfulness and the individual interest of each employee that too much stress cannot be placed upon the education of the workman along these lines, and the desirability of keeping the subject actively before his mind.

Workmen's Safety Committees

One of the most important agencies for this purpose has been the workmen's safety committees which are established in every plant of the American Steel & Wire Company. These committees make weekly inspections and are urged to be constantly on the lookout for new safety suggestions, or the enforcement of those already in effect, and their personnel is changed at frequent intervals, so that a large number of men receive the benefit of this experience. More than 1000 men out of a total of about 30,000 employed by the company are thus brought into direct contact with the safety problem each year and made to realize something of the object aimed at, and it can be readily understood what an effective agency this represents.

Committees are sent from one mill to another of the American Steel & Wire Company, as well as from one subsidiary company to another of the United States Steel Corporation, and this gives the stimulating effect of healthy competition. A committee which finds some set screws in the machinery of a neighboring plant and writes them up in its report is likely to go back home with a keener eye for its own short-comings and a strong resolve to eliminate every projecting set screw there before the visit is returned.

I will not burden you with a description of the permanent foremen's safety committee which is organized in each mill, or of the special inspectors who look after cranes, engines, shops and other more important equipment. I will not tell you of the district safety inspectors who are constantly at work in addition to these local agencies and you already know about the State factory inspectors, who add their quota to that which our own men accumulate.

When I tell you that there are no less than eight distinct agencies of this sort, each viewing the matter from a different angle, and all actively engaged in making inspections and piling up safety recommendations, I think you will begin to sympathize with the mill superintendent who is responsible for carrying out the recommendations. I fear you will agree with the social investigator who alluded to this matter in a recent magazine article, and spoke of the mill man as having "safety cranks" added to his otherwise overburdened existence. The superintendent is instructed that he must not make repairs or do any work on machinery while it is in operation; and he is now forbidden to have repair gangs out during the Sunday shut-down, which used to be the favorite time for getting these matters cleaned up. He is not infrequently placed in a quandary as to whether a mill should be stopped and 100 men stand idle while a safeguard is being installed, or whether he shall take a chance on an accident happening before a regular shut-down occurs.

And yet, notwithstanding all this, the work is being done as fast as the recommendations are turned in. As many as 300 or 400 individual suggestions are carried out monthly in some of the larger mills. Special "safety

gangs" of from two or three up to 12 or 15 men are constantly at work on present equipment in each of the plants, and new installations are being designed and erected so that adequate safety provisions are made from the start.

Some General Conclusions

Much is being said these days about "workmen's compensation," and "employers' liability," and, as you all know, new legislation of this kind is now being drafted in a number of States. Both these lines of effort are valuable, tending as they do to a fairer economic distribution of the burden of industrial accidents, and carrying with them a certain punitive effect for the employer who is careless or indifferent to the safety of his workmen. But how much more important than liability or compensation laws, which take effect after a man has been injured, is the actual prevention of the injury! That eliminates alike both questions of responsibility and remuneration and checks the evil at its fountainhead.

Legislation is necessary for the protection and preservation of society, and yet it is largely expressed in terms of negation. We can say "Thou shalt not kill"; "Thou shalt not steal"; "Thou shalt not bear false witness against thy neighbor"; but who could ever hope to enact a law big enough and broad enough to specify all the positive constructive activities of a social community? And so it is with the accident problem; positive constructive work that does not confine itself to the mere limits of legislation is the thing that is necessary if we are to realize anything like the full possibilities of accident prevention.

Illinois now has one of the most rigid factory laws in the United States and its staff of inspectors is probably equal to that of any other State. About a year ago one of the State inspectors in going through an Illinois plant of the American Steel & Wire Company stated that he considered it the best equipped from the safety standpoint of any of several hundred plants which he had visited. He made no report of recommendations for further improvement—and yet each one of our own inspectors who are at work in that plant is making continual additions to its list of safety recommendations, and we have been spending, and will continue indefinitely to spend, about \$1,000 per month on safety work in this particular mill.

Some time ago an Ohio inspector visited one of the company plants in Cleveland, and in commenting on conditions, he said that it was the first plant he had ever inspected in which he did not make some recommendations. A little later another mill was added to the same honor roll. And yet our local inspectors are busy in those plants, and a constant volume of safety work is under way there at all times. I cite these instances not with any desire to exploit or magnify the work that is being done in our own company but because they cast an interesting side light on the extent to which the work of progressive accident prevention outdistances legislation.

The Movement Wide Spreading

And, notwithstanding the indifference that is sometimes manifested in this direction, I feel that a note of optimism is not out of order at this time. The energy and resourcefulness of some of the most efficient industrial organizations of the world are now being directed upon the problem of accident prevention. I have made frequent mention of the United States Steel Corporation because I am familiar with the work it is doing, but I also know that there is a widespread and growing interest in the problem all over the country. The International Harvester Company, the National Cash Register Company, the Westinghouse Electric Company, the Jones & Laughlin Steel Company, the Lackawanna Steel Company, and many other large manufacturing and railroad organizations have safety and welfare departments, which are all working along the same lines.

There are other agencies such as the American Museum of Safety in New York, the National Association of Manufacturers, the accident insurance companies and various engineering and trade organizations which are taking an active interest in accumulating and scattering abroad information on this subject, and rapid strides are being made in the general improvement of safety conditions.

The problem is not so much that of the large manufacturer, who is used to looking at such things in a

broader way, as it is of the owner of a small plant where only a few men are employed. To him the cost of protective measures looms up like a threatening cloud on his financial horizon. He feels that this expense is coming directly out of his own pocket, and prefers to take chances on a possible future penalty rather than meet the unavoidable present cost. In the aggregate this class of manufacturers employs a large body of men, and is more difficult to reach on account of the smaller working units into which it is divided, and the great number of people who must be interested individually before they will do anything along this line.

Yet there are ways in which the small employer must inevitably be reached, sooner or later. The wave of legislation that is spreading over the country will help bring the matter home to him, through the heavier penalties that will be imposed, and because these penalties will be made unavoidable, instead of leaving so many loop-holes through which he may escape.

The pioneer work that is being done by some of the large concerns which I have mentioned, will aid immeasurably, by demonstrating the practicability of all sorts of safety devices and by arousing greater interest in their use. There are many dangers which are commonly considered as "unavoidable trade risks," where it can be demonstrated that they are not unavoidable, and that they can be almost completely eliminated if the necessary effort is put forth. Such is the case with the blacksmith's hammering tools, the wire drawers' hand leathers, and the ladder accidents which I have described.

Results of Research Open to All

But before much general interest can be aroused it is necessary for someone to show conclusively that a given safety device is practical, and that it will not cause too much interference with the necessary actions of the workmen. This is being done on a large scale by the United States Steel Corporation, and the benefit of its experimental work is being passed out freely to all who apply—even to the man who is in competition for the same lines of business.

As regards the question of cost—it is my personal opinion that this can be made to take care of itself. I believe it can be proven that the large expenditures which are necessary to carry out a broad policy of protection will pay not only a good rate of interest on the money invested, but a sinking fund as well, so that what seems to many people like an unproductive outlay of money can be shown to be a paying investment.

So far as I am aware, there are no convincing records of this sort available at present, and it takes a period of years to make such a record convincing. If we can ultimately prove, as I think we can, that the use of safety equipment will make a good return in hard American dollars, it will be a most important contribution to the cause of accident prevention, and will remove the greatest obstacle in the mind of the man who is not susceptible to the less obtrusive, humanitarian motive, which ought to be the most impelling one of all.

A Policy of Conservation

Conservation is a subject that is now receiving a large degree of attention, and when we listen to the appeal of the men who would preserve our forests and conserve our public lands we are almost convinced that this is the paramount question before the public today. A human life is something that cannot well be valued in dollars and cents, but I have seen estimates of the economic loss in the United States as a result of industrial accidents, varying from \$250,000,000 to \$300,000,000 per year. I will not attempt to corroborate these figures for you, as there is necessarily a large element of guesswork in such approximations. I do not believe their evidence is needed, however, to convince you that the conservation of the heads and hands of our workmen is at least equally important with any other of the conservation movements now under way.

Millions of dollars are being set aside and powerful organizations and influences are being brought to bear on the establishment of "universal peace"; but we have seen that the loss of human lives in the greatest war of recent years is outdistanced by that of 12 months' peaceful industrial activity in the United States.

The country at large is just beginning to awaken to

the seriousness of the accident problem, and is turning in haste to legislation, which, to many people, is the panacea of all social evils. But I tell you the condition is not one that we can correct by mere legislation, any more than we can legislate selfishness out of the minds and hearts of mankind. Impulsiveness is a trait of human nature that is not confined to the American people, but it is one that they possess in no small measure. A theater is burned in Chicago, and many people killed. All over the country a storm of protest arises and stringent regulations are enacted for the protection of theater-goers.

A few years elapse, and a schoolhouse takes fire in Cleveland, involving an appalling loss of life among the children. Almost immediately holes are knocked in the walls of all the other school buildings of the city, in a hurried effort to improve safety conditions, and in some cases those openings in the upper walls stand for days with their added element of risk before outside fire escapes can be placed. Each of these tragedies is followed by spasmodic action of the same sort in various parts of the country.

Was there any new and acute condition in existence after the Chicago fire, and after the Cleveland fire, which made necessary the precipitous and instant application of safety measures? Absolutely none! There was no condition that could not have been foreseen and remedied by quiet, thoughtful, intelligent effort before the catastrophe occurred.

And let me reiterate, this is what is needed in treating with the problem of industrial accidents, not an outburst of strenuous but shortlived activity after each successive disaster, with an occasional act of legislation "by way of good measure," but the same careful, thorough, systematic study of conditions and overcoming of obstacles that would be used if we were building a bridge or digging a canal.

Legislation Not the Primary Need

Legislation is not the thing that is needed primarily. Most of the States already have specific legislation covering certain important classes of machinery, with general blanket clauses to comprehend the rest. Note, for example, the following quotation from the Pennsylvania laws: "All vats, pans, saws, planers, cogs, gearing, belting, shafting, set screws, grindstones, emery wheels, flywheels and machinery of every description shall be properly guarded." This is broad and comprehensive enough to cover everything now in use in the mills, or likely ever to be designed; but until some one demonstrates when a machine is "properly guarded" we cannot hope either to gain much from the present general legislation of this character, or to enact new laws that will be more specific in their provisions.

The issue is largely a moral one after all. Nowhere is the old adage about "Leading a horse to water" more fully realized than in the application of safety devices. It is possible to force a certain device into position through the agency of legislation or some other form of authority, but unless the man who has to use this device accepts it in a friendly spirit he can make it of less than no value for the accomplishment of its purpose. To bring about the highest possible perfection of safety conditions in a mill it is necessary for each person in that mill, from the superintendent down, to be in sympathy with the movement, so that he will look for the good points and not the objectionable ones in everything that is done. When this condition is attained every law might be erased from the statute books, and the cause of safety would lose not a particle. Without this condition no volume of legislation can accomplish the desired end.

Humanity at large is not hard-hearted or indifferent. I do not believe there is an official in any business enterprise today who will not favor a safety measure if he is convinced that it is practical and is of real value in reducing an actual danger.

So, in concluding, this is the thought that I would leave with you. There is an accident problem, and it is a most important one, from the social and economic standpoint, as well as that of human happiness. Much can be done to improve conditions and rapid progress is now being made in overcoming the practical, legitimate difficulties and objections that are encountered. Legislation of a mature and intelligent kind will add a certain contribution, and tend to equalize the benefits that may be obtained. But finally, and of more importance than all

the others, is the necessity for a thorough-going study of the causes of accidents, and an effective demonstration of the preventive measures which are possible in each particular industry. When this information is put before them, we can depend on the men who are responsible for carrying on these industries to do the rest.

[The End.]

A New High Duty Drill

A Recent Product of the Foote-Burt Company

As an addition to its line of high duty drills the Foote-Burt Company, Cleveland, Ohio, is placing on the market a new machine designated as its No. 25½ high duty drill. This machine has a capacity for high speed drills up to 3½ in. in solid steel to their fullest capacity. It is capable of drilling to the center of a 36-in. circle. This machine was brought out to fill a gap between the company's No. 25 drill with the same swing, but with a cutting capacity of only 2½ in., and its No. 26 machine with a cutting capacity of 3½ in. and built with two throats providing swings of 44 and 60 in. The latter machine was described in *The Iron Age* April 2, 1908. The general mechanical construction of the new machine is similar to that of the other sizes of high duty drills now made by this company, the line now consisting of seven sizes. Following the principle adopted in designing other sizes of high duty drills, that to get efficiency from high speed drills it is necessary to have a rigid machine, important features of this machine are the extreme rigidity of its construction, the massiveness of its frame and weight, the use of the highest grade of material for the different requirements and the powerful driving mechanism. A new feature in the No. 25½ machine is the use of Hyatt high duty roller bearings for the main driving shafts at the base and the top of the machine. All other bearings are bronze bushed. Spur gears, which are always in mesh, are used throughout, except one pair of miter gears at the driving end and one worm and worm gear for the feed.

The new machine was exhibited at the convention of the American Railway Master Mechanics' and Master Car Builders' associations at Atlantic City last month, and drilling tests at that convention, using the high speed drills of the Cleveland Twist Drill Company, attracted a great deal of interest. A drilling speed of 57½ in. per minute was obtained in cast iron, which the company believes establishes a record for drilling. All of the drills used in this series of tests were of the standard flat twist type, except No. 8, which had a milled shank, and the results obtained are given in the accompanying table:

Drill No.—	1	2	3	4	5	6	7	8	9	10
Size, in.—	1¼	1½	1¾	2	2½	3	3½	4	4½	5
Material, Cast iron	4	1	1/32	in. deep.						
Speed, r.p.m.—	575	355	350	190	120	350	225	175	150	150
Feed per revolution of drill, in.—	0.10	0.10	0.10	0.05	0.10	0.03	0.04	0.04	0.03	0.03
In. drilled, per minute—	57.5	35.5	35.0	9.5	12.0	10.5	9.0	7.0	4.5	4.5
Peripheral speed, ft. per min.—	163.6	139.4	160.0	115.0	94.0	113.7	94.8	114.7	116.0	127.0
Metal removed, cubic inches—	70.60	62.70	84.18	39.90	84.80	12.80	18.60	34.30	31.70	37.33

The spindle is of forged high carbon steel, 3 in. in diameter in the sleeve and 2¾ in. at the driving end. The nose of the spindle is fitted with a No. 6 Morse taper socket. The sleeve is 24¾ in. long, 4½ in. diameter and has a ball bearing thrust collar of the company's own make, which is guaranteed not to crush and to withstand hard continuous service without breakage of the balls. A power feed of 16 in. is provided for the spindle, which is 18 in. from the face of the column.

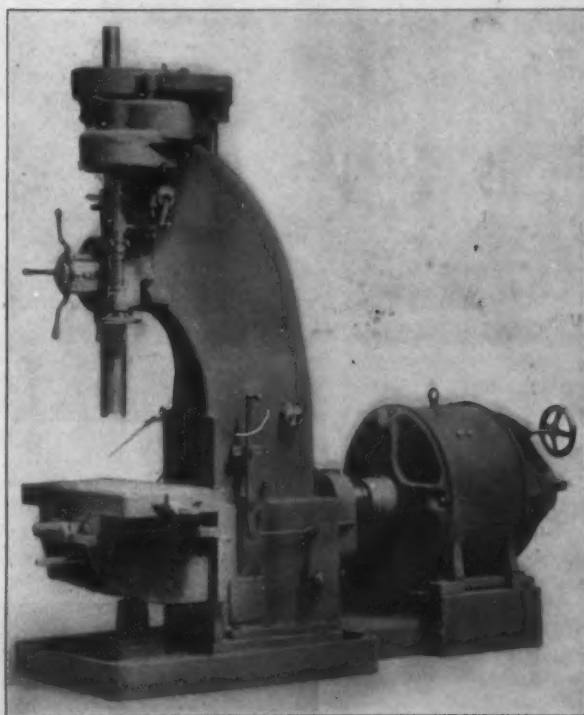
Nine changes of geared feeds are provided through the change gear mechanism located at the side of the spindle. All speed changes are through a quick change gear device operated by levers located at the front of the machine and within easy reach of the operator. These changes are made by the entering of a lock bolt through the shaft in a hole in the gears, the shaft being shifted to its various positions by a rack-and-pinion connection with the operating lever.

Power feed is provided with an adjustable automatic stop and a hand stop. Hand feed is through worm and worm gearing, and quick traverse of the spindle in either direction is accomplished through a spider hand wheel

located at the front of the machine, which with either the in or the out movement of any or all of the handles engages or disengages the same.

The regular drive consists of a four-step cone pulley mounted on the base in the rear of the machine and driven from a countershaft hanging from the ceiling. Four additional changes of speed are provided by two-to-one back gears located in the base of the column and operated by a lever on the side of the machine. The speeds of the spindle range from 25 to 200 r. p. m. The motor drive, as shown in the accompanying illustration, consist of a 20-hp. four-to-one adjustable speed motor with a range of from 300 to 1200 r.p.m., geared direct with two-to-one reduction and back gears, giving a further gear reduction of four to one, and giving spindle speeds of from 37½ to 600 r.p.m.

The table is of the bracket knee type, having a large square lock bearing surface on the upright, to which it is securely gibbed. It is elevated and further supported by a square thread telescopic jackscrew located underneath. This jackscrew is set slightly back of the spindle to permit boring bars and other tools to pass through the table. The table is provided with a large oil groove and two T slots. The table has a working surface of 24 x 24 in. As an



The New No. 25½ High Duty Drill Built by the Foote-Burt Company, Cleveland, Ohio.

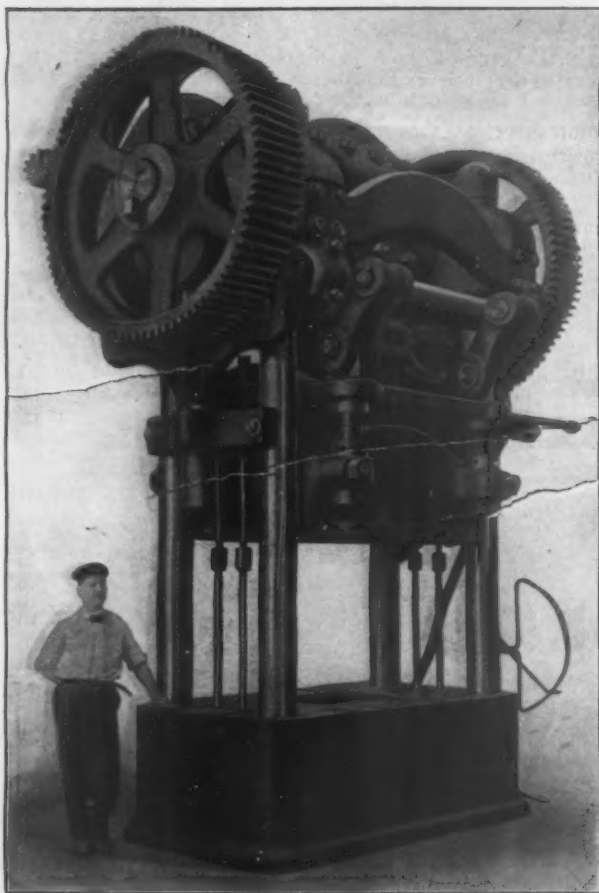
extra attachment the machine has a compound table, which has a longitudinal adjustment of 14 in. and a cross adjustment of 8 in. The top platen is fitted with two T slots, running lengthwise, and it also has a large oil groove. It has a working surface of 16½ x 30 in. The compound table reduces the maximum distance from the nose of the spindle to top of table 5¼ in.

The following table gives the principal dimensions and specifications of the drill:

Distance between spindle center and column face, in.....	18
Maximum distance between spindle nose and table top, in.....	31½
Length of power feed, in.....	16
Diameter of spindle sleeve, in.....	4½
Width of spindle sleeve steel rack, in.....	24¾
Diameter of spindle, driving end, in.....	2
Diameter of spindle in sleeve, in.....	3
Diameter of spindle nose, in.....	41/16
Morse taper of spindle, No.....	6
Working surface of plain table, in.....	24 x 24
Working surface of compound table, in.....	16½ x 30
Longitudinal adjustment of compound table, in.....	14
Transverse adjustment of compound table, in.....	8
Vertical adjustment of table, in.....	18
Number of feed changes.....	9
Minimum feed per revolution of spindle, in.....	0.0075
Maximum feed per revolution of spindle, in.....	0.1009
Minimum spindle speed, r.p.m.....	25
Maximum spindle speed, r.p.m.....	200
Speed of countershaft, r.p.m.....	400
Number of cone pulley steps.....	4
Diameter of smallest cone pulley step, in.....	12
Diameter of largest cone pulley step, in.....	24
Face width of cone pulley steps, in.....	4½
Net weight, lb.....	7,000

A New Toggle Drawing Press

The substitution of steel stampings for castings and forgings in the manufacture of automobiles has led to the



A New Double-Action Toggle Drawing Press for Automobile Parts
Built by the Ferracuta Machine Company, Bridgeton, N. J.

design of a number of new presses for producing work of this character. The Ferracuta Machine Company, Bridgeton, N. J., has recently built a press from designs of its president, Oberlin Smith, which is illustrated herewith. Although it was primarily designed for deep double-action work, such as brake drums, gear cases, dust covers and other automobile parts, it is possible by disconnecting the toggles at the front and the back to convert the machine into a long stroke single-acting press. When changed in this way a greatly increased capacity is secured.

An iron casting which is internally ribbed and trussed is used for the base and projecting upward from the four corners are 9-in. steel columns. These fit into holes bored in the base and are firmly fastened in position while they are connected at the top by heavy castings, the end stays containing the journal bearings for the shaft. In addition to taking the tensile stresses set up while the press is in operation, the four columns act as slide bearings for the ram. The shaft is a heavy steel forging 12½ in. in diameter at the journals and 15 in. at the crank.

Steel gears with cut teeth are keyed to the ends of the shaft and a cam-groove in one of them transmits vertical motion to the yoke at the left of the machine. This yoke imparts a partial rotary motion to the toggle shaft, which in turn drives down the ram. The plunger or inner ram to which the upper die is attached is driven by the crank at the middle portion of the shaft.

The following table gives the principal dimensions and specifications of the machine:

Overall, height, in.....	192
Depth, in.....	110
Maximum distance between bed and ram, in.....	48
Width, in.....	200
Maximum distance between bed and plunger, in.....	61
Stroke of ram, in.....	13
Stroke of plunger, in.....	36
Vertical adjustment of ram, in.....	8
Vertical adjustment of plunger, in.....	8
Pressure exerted, tons.....	1,000
Diameter of fly wheel, in.....	50
Face width of fly wheel, in.....	12
Weight of fly wheel, lb.....	3,000
Total weight of press, lb.....	140,000

The equipment regularly furnished with the press includes a set of wrenches and the other tools ordinarily supplied with a machine of this character.

An Example of Good Machine Shop Lighting

Good light and good ventilation are two important requirements in a machine shop and of late considerable attention has been paid to this subject by owners and shop superintendents. At the present time a large number of plants are being equipped with windows which are designed to provide a maximum of glass area with a minimum amount of supporting material. Steel is generally employed for this purpose and the Detroit Steel Products Company, Detroit, Mich., has recently installed a large number of Detroit-Fenestra solid steel window sash at the plant of the Gear Grinding Machine Company of that city.

The plant of this company is of reinforced concrete construction, is three stories high and occupies a ground area of 90 x 150 ft. It is practically fireproof in its construction and solid steel window sash are used throughout. A portion of the machine shop on the third floor is shown in the accompanying engraving and gives a very good idea of how well a machine shop can be lighted and ventilated by the use of the Detroit-Fenestra



A Portion of the Interior of the Gear Grinding Machine Company's New Plant, Showing the Use of Detroit-Fenestra Windows Made by the Detroit Steel Products Company, Detroit, Mich.

solid steel window sash. The bays are 20 ft. wide and the windows, which are 10 ft. high overall, extend from approximately 3 ft. above the floor to the ceiling. Each

section is equipped with a double ventilating window hung on pivots in the center of each and operated by a peg and stay lock, each pair being joined by a connecting bar. The sash are of the standard type of the manufacturer. An abundance of air is afforded by the use of these windows as there are eight ventilators in each bay.

A Ring Grinding Wheel Chuck

Charles H. Besly & Co., 118 North Clinton street, Chicago, Ill., have recently developed a pressed steel ring wheel chuck, to which the name *Helmet* has been given, for holding cylinder or ring grinding wheels for roughing

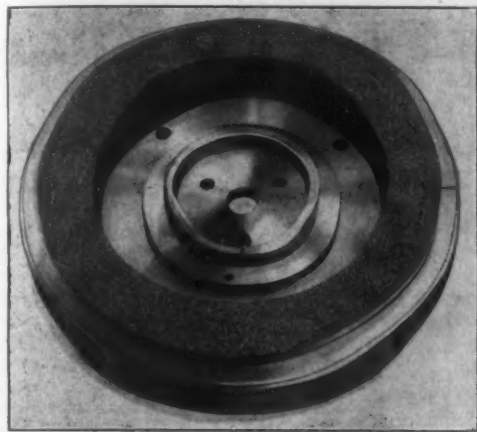


Fig. 1—The Helmet Pressed Steel Ring Wheel Chuck Made by Charles H. Besly & Co., Chicago, Ill.

off scale and excess stock when the work is too rough and rugged to be ground economically with emery cloth disks. The special advantages claimed for the chuck are safety, light weight, simplicity of operation, adjustability for wear, a minimum overhang and economy in use. Fig. 1 is a view of the chuck, while Fig. 2 shows at the left a hub or center such as would be used on any ordinary grinding spindle, while the middle view is a section showing the chuck as used on disk grinders or fastened to a collar, while the view at the right is a front view.

The chucks are light in weight and as they are designed without external projections practically all danger of their bursting in service has been eliminated. The working face of the ring wheel is always near the steel chuck body and is rigidly supported by it, thus assuring safety. The spindle bearings project into the chuck, thus obtaining a minimum overhang. Economy in use is secured as the ring wheel can be worn to within $\frac{1}{2}$ in. of its maximum depth with safety, and at the same time the cost of these wheels is approximately 25 per cent. less than cup wheels of the corresponding size. As compared with grinding on the periphery of the ordinary form of emery wheel the cylinder or ring grinding wheel mounted in a pressed steel ring wheel chuck enables a better finish to be secured where much work is being done, since the same diameter is always maintained, thus avoiding the necessity of a change in speed and the grinding is accomplished on a flat surface instead of on a curved one. Referring to the central and the right portions of Fig. 2, which show details of the chuck, A is a split clamp ring which holds the grinding ring B in place. This ring is surrounded by the chuck body C, to which the hub or center D is riveted. The grinding ring is kept in the proper position by the nut E, which sets it out.

For economical face grinding on rough stock the abrasives should run at a speed of 5000 ft. per minute

and work should be forced against the grinding wheel with a pressure of approximately 50 lb. per square inch, conditions under which it is claimed a cup wheel cannot be operated with safety.

These chucks can be furnished for holding ring wheels ranging in diameter from 10 to 30 in. for use on any make of disk, face, edge, knife, side bar or vertical surface grinder, or for hubs bored for use on an ordinary emery wheel arbor, as shown at the left of Fig. 2.

Powder for Ready Plating of Metals

An instantaneous electroplating powder for precipitating gold, silver, copper, tin and nickel on other metals has been developed by Arthur E. Firth, Auckland, New Zealand. A short time ago the opportunity was given at the Hotel Astor, New York City, by Holmes C. Walton and F. A. Hood of Wellington, New Zealand, to observe the application of the powder. A cloth wet with water was dipped into the powder and rapidly applied to the metal to receive the deposit, such as the blade of a steel household knife, the friction resulting from the rapid rubbing of the powder covered cloth being seemingly an essential. The process is described as electrolytic in its nature, and the plating accompanied with effervescence of the moistened powder.

It is understood that Mr. Firth has been for several years making a special study of the subject and did not reach success until December, 1909. The powder has been given the name *Voltite* and, of course, offers itself especially as a household article where, for example, household utensils, faucets and the like may be kept in condition with the important feature that the polishing or renovating of the articles is not accompanied by a partial removal of a deposit already on the articles but by an addition to that already existing. It is stated also that a compound has been prepared for securing a preservative deposit on iron and steel.

Aiken Hydraulic Valves.—The Pittsburgh Valve Foundry & Construction Company, Twenty-sixth street and Allegheny Valley Railroad, Pittsburgh, has purchased all of the drawings, patterns, tools and good will of the Hydraulic Machine Company, Pittsburgh, covering that

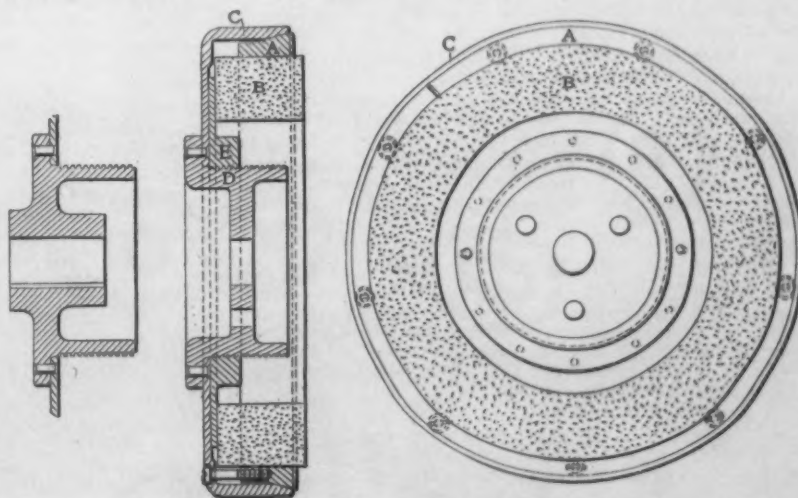


Fig. 2.—Details of the Chuck.

company's Aiken hydraulic valves. It had made these valves for a number of years under a royalty arrangement with the late Henry Aiken, patentee, and it will now supply the trade direct with the full line.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, will at its annual meeting July 25 vote on an increase in the capital stock from \$10,000,000 to \$15,000,000. The new stock is to be 7 per cent. cumulative preferred, on which dividends are to be paid quarterly; it is to be redeemable for 1921 at \$105 plus any arrearages in dividends, but the stock has no voting power with it. The company signed its annual wage scale with the Sons of Vulcan July 8, and the puddling department is again being operated.

The Machinery Markets

Activity among purchasers of machinery indicates the development of a buying movement in the New York market. Three automobile lists are expected to be closed shortly and some good purchasing is looked for from other sources. The automobile makers are now placing orders in Cleveland for equipment for next year's models, and machine tool builders in that territory report a generally better demand. The automobile trade is also buying liberally in Detroit, principally for replacements, and there are inquiries out for equipment for next year's output. A fair volume of scattered sales is noted in Chicago, but there is nothing new in the way of lists. Beyond an increased demand for wood-working machinery, conditions are unchanged in Cincinnati, where much interest is naturally being taken in the crop outlook. Trade is quiet in St. Louis, but the market has a good undertone. A number of new enterprises that will call for expenditures for metal-working equipment have come forward in the South and in Texas. Texas dealers are expecting some good business to result from contemplated railroad construction work in Mexico. On the Pacific coast business is growing and a good demand for heavy tools has developed. Dealers in San Francisco are also booking some good orders for wood-working machinery. In all parts of the country there seems to be a general revival of interest in projects that have been dormant for some time because of the general uncertainty of business conditions.

New York

NEW YORK, July 19, 1911.

Prospective purchasers are showing much more interest in machinery matters. A number of enterprises which have been hanging fire for some time are being revived and there are indications that several good-sized lists are to be closed out shortly. There is a better volume of new inquiries in the New York market and requests for quotations on small lots of tools are resulting in business. Purchasers show more promptness in closing out and altogether the tone of the market has improved within the last few days. There are indications that the General Electric Company will bring out a large list and the Saurer-Motor Company will soon close for a good quantity of machine tools. The Public Service Corporation of New Jersey has been buying machine tools, particularly for its Newark repair shops. Some of this company's inquiries are still unfilled. Two other automobile companies are expected to buy in this territory in the near future, and the Westinghouse Electric & Mfg. Company, of Newark, N. J., is preparing to issue a list. In addition to these enterprises, all of which have been talked of for some weeks, some new projects have come forward which will result in business. This influx of new business has tended to stiffen selling terms and dealers and manufacturers all along the line are refusing concessions which in some cases were granted to induce business up until a short time ago. The jobbing foundries in this vicinity report a renewed call for machinery castings and the trade in small engines which has been slack, is picking up. New construction work on small industrial plants, factory lofts and office buildings, has increased the inquiries for small power units. The demand for engines of the heavier type is not so good.

The American Radiator Company, Chicago, Ill., whose New York offices are at 104 West Forty-second street, has awarded a contract to the Lackawanna Bridge Company, 2 Rector street, New York, for a two-story building, 270 x 287 ft., to be erected at Bayonne, N. J. It is estimated that the plant will cost \$200,000. The details regarding the mechanical equipment are being worked out in Chicago.

The Westinghouse Electric & Mfg. Company, Newark, N. J., which recently acquired title to the plant of the Lauter Piano Company, is having constructed an extensive addition, joining the Westinghouse works with the old piano factory. The company is preparing a machine tool list which will be issued shortly and purchases will be made, it is understood, before the summer is out.

The Saurer Motor Company, Plainfield, N. J., which recently took over the plant of the Q. M. S. Company there, is preparing to make additional purchases to be installed in addition to the works which are now about completed. The addition included a machine shop about 75 x 125 ft. and an assembling department, 75 x 100 ft. This added manufacturing area about doubles the capacity of the original plant, and it will be equipped with a full line of machine tools used in the manufacture of industrial trucks.

The General Electric Company, through its Schenectady office, is making inquiries which indicate that it intends to spend at least \$10,000 for machine tool equipment. It is understood that this machinery is to be delivered to the Schenectady works, but the company has not filled all of its immediate wants for the

plant at Erie, Pa., which is operated under the name of the Pennsylvania General Electric Company.

Work has been begun on the erection of a plant on McClelland street, near Frelinghuysen avenue, Newark, N. J., for the Natural Carbonic Gas Company, which will move its present large works at Saratoga, N. Y., to Newark, on completion of the buildings. In addition to power plant equipment the company will install carbonic gas-making apparatus and tank-making and filling equipment. C. E. Reid is in charge of the construction, with offices at the site of the proposed plant.

The American Cotton Oil Company, 27 Beaver street, New York, which has been purchasing metal-working equipment in this market, has acquired a plot of land at Bayonne, N. J., with riparian rights, where a large plant for the manufacture of cotton oil products is to be erected. The construction details have not been worked out as yet.

The Newark Automobile Company, Newark, N. J., has opened offices in rooms 604-5 Essex Building, that city, where details are being arranged for the purchase of the necessary equipment to begin the manufacture of the Newark industrial truck. Herman Kolberg is to superintend the new plant.

The Simplex Automobile Company, 614 East Eighty-third street, New York, will shortly buy mechanical equipment for its nearly constructed plant at New Brunswick, N. J. The company has been making inquiries, and it is understood that its list is now in course of preparation.

The Carter & Bell Rubber Company, Millburn, N. J., has begun work on a reinforced concrete factory, 60 x 150 ft., which is being erected at the boundary line of Summit and Springfield, N. J. The plant will be used for the making of fillers for automobile tires. In addition to a power plant a general line of rubber working machinery will be installed.

The Ideal Hatpin Shield Company has been incorporated at Buffalo, N. Y., with a capital stock of \$30,000, to manufacture guards for hatpin points, and will establish a factory in that city. The directors are J. M. Secord and William Honecker, Buffalo, and C. Johnson, Cleveland, Ohio.

The Joseph A. Schantz Company, 115 Central avenue, Rochester, N. Y., has let contract for the erection of a six-story and basement furniture factory and storage warehouse, 44 x 100 ft., at Central avenue and St. Paul street, that city.

Maas & Walstern, Inc., Niagara Falls, N. Y., have leased two acres of land at Adams avenue and Twenty-sixth street from the Niagara Falls Power Company, and will erect thereon a fireproof electrochemical manufacturing plant. The company now operates a plant at Newark, N. J., with general offices at 100 William street, New York.

The general contract for the erection and equipment of the power plant for the Tuberculosis Hospital which is being built by the city of Buffalo at Perrysburg, N. Y., has been let to Charles A. Hager, of Perrysburg.

The Front Drive Motor Company has been incorporated at North Tonawanda, N. Y., with a capital stock of \$50,000 to manufacture motor trucks, engines, machinery, electrical appliances, etc., and will arrange for a factory in that city. The incorporators are W. Christie, F. J. Adler and W. A. Fleming, New York City.

The Pratt Chuck Company, Frankfort, N. Y., will erect a one-story factory building, 85 x 350 ft. Bids are now being received.

THE MACHINERY MARKETS

Bids are being received by the Board of Water Commissioners, Suffern, N. Y., John I. Crane, president, for installing a water sterilization plant and a mechanical water filter.

The Quick & Thomas Company, Auburn, N. Y., has been incorporated to manufacture and deal in boilers, machinery, etc., with a capital stock of \$50,000. C. B. Quick, C. A. Thomas and H. A. Fitzwater, of Auburn, are the incorporators.

The Maxwell Steel Vault Company, Oneida, N. Y., has plans under consideration for a factory building, 40 x 200 ft., two stories, which it expects to build this summer.

The American District Steam Company, which is concentrating its entire plant at North Tonawanda, N. Y., is completing its new machine shop and office building in that city. The building, which is of concrete and steel construction, is triangular in shape, fronting 250 ft. on Bryant street, 240 ft. on the Erie and International Railways, and is 80 ft. in width, the offices occupying space 66 x 80 ft. When the building is finished, the fore part of August, the machine shop department and the general offices of the company will be transferred from Lockport, N. Y., to North Tonawanda.

New England

BOSTON, MASS., July 18, 1911.

New England is at the height of the summer stagnation. A great many works are shut down, some of them following the annual vacation program, while more are curtailing production in this manner. Those plants which are dependent upon water power are seriously crippled by the results of the long period of drought, and in some cases, where auxiliary power is insufficient, have been compelled to cease manufacturing. Nor will they be able to start up again until protracted rains have replenished the rivers. The drought is so general and has been of so long a duration that most industrial cities and towns are threatened with a water famine. The authorities are beginning to take drastic steps to procure a minimum consumption of water.

The machine tool builders have as yet seen no important increase in demand, but in most cases there has been no serious falling off since the hot weather set in. While business is not really good with them nevertheless the average production of machinery in this territory is probably close to that when business was at its top notch four or five years ago. The difference is that producing capacity has been greatly increased in this period and a correspondingly greater market must be obtained before the shops are run at full capacity. It is an interesting fact that in spite of the rather protracted period of dull business manufacturers still regard a normal market as one that requires a rush of manufacturing in their plants. That is their standard of business, and until it has been attained a genuinely satisfied expression will not be heard.

The machinery dealers are doing some business, but their salesmen are not bringing in a volume of orders that would be considered satisfactory. Very naturally the increase in the machinery market would not follow immediately upon improvements in the iron and steel situation. It is always true that the machine tool business is one of the last to revive after depressed conditions. Most observers believe that before cold weather sets in a very marked change for the better will have been experienced.

The Boston & Maine Railroad, in a petition to the Massachusetts Railroad Commission for authority to use certain funds, makes the statement that it is inadvisable to proceed with a large part of the improvements planned for this season. The general deduction is that the statement applies in part to proposed shop facilities, including the great locomotive and car repair shops which are planned for North Billerica, Mass.

The Gilbert & Barker Mfg. Company, Springfield, Mass., manufacturer of gas apparatus, will, it is said, erect a large and completely new plant in that city. It will consist of eight buildings. The machine shop will be 63 x 105 ft., two stories; the sheet metal building 160 x 250 ft., one story; power house, 52 x 90 ft.; testing house, 25 x 30 ft.; office building, 40 x 65 ft., two stories and basement, and two storage buildings, 30 x 90 and 30 x 170 ft. respectively. All the buildings will be of brick, mill construction.

Additions to general manufacturing plants in New England include the following: The A. C. Lawrence

Leather Company, Peabody, Mass., five-story building, 75 x 175 ft.; Rathbon Knitting Company, Woonsocket, R. I., spinning mill, 58 x 110 ft.; Clark Dye Works, Pittsfield, Mass., dye house; Oliver M. Dean, Worcester, Mass., broom factory, 48 x 72 ft., two stories and basement; Laviseur & Company, Salem, Mass., leather, six-story factory.

J. Spauldings & Sons' Company, Rochester, N. H., hard fiber mill at North Tonawanda, N. Y., 265 x 300 ft., one story, and 60 x 265 ft., two stories, with smaller buildings for machine shop and power plant.

The contract for the 80-mile section of the Aroostook Railroad system from Washburn, Me., west across Aroostook County, has been awarded to Arthur R. Gould, Presque Isle, Me., general manager of the Maine & New Brunswick Electric Company. This new road, which will shorten the distance between St. John, N. B., and Quebec by nearly 200 miles, by connecting existing lines, will cost \$7,500,000.

The G. W. Bradley's Sons, Inc., Westport, Conn., is making inquiries as to a special machine for rolling or forming axe patterns or poles.

The Hendee Mfg. Company, Springfield, Mass., manufacturer of motor cycles, states that its plan is to occupy the building just purchased of the Otis Elevator Company immediately after the latter vacates it October 1. Only a few improvements will be necessary. No enlargement is probable for another year, the new space added to present facilities being sufficient for the immediate needs of the business.

A partnership has been formed between Ira B. Hubbard and Chester E. Williams, Worcester, Mass., under the name of the Hubbard Machine Company. The business has been conducted by Mr. Hubbard for some time. The company will make a specialty of repairing and manufacturing woolen mill machines and will do other kinds of machine repair work.

The Corona Mfg. & Supply Company has established a factory at 311 Atlantic avenue, Boston, Mass., for the manufacture of metal specialties among which are a new type of drill socket and a flexible metal hose.

The Southern New England Railway Company, which will build the Rhode Island extension of the Grand Trunk system, proposes to carry out extensive and costly engineering work in connection with the construction of the line from Palmer, Mass., to Providence, R. I. The work will include a tunnel through Capitol Hill in Providence. This road will pass through the important manufacturing centers of Pawtucket, Central Falls and Woonsocket, R. I., and the towns of Lonsdale, Berkeley, Ashton, Albion and Manville.

Philadelphia

PHILADELPHIA, PA., July 19, 1911.

Inquiries for standard lines of equipment are scattered and of small size. Occasionally a fair inquiry for tools and machinery of a special nature develops, but even in that field the demand drags. While the railroads are gradually broadening their purchases in some lines, buying of machinery equipment continues extremely light. While immediate conditions are not particularly promising in the general trade, a hopeful feeling that a betterment will not be far distant is expressed. Encouragement is taken from the improved conditions existing in the iron and steel trade, although they have not yet reached the point where any necessity for additional equipment has arisen. There has been little movement in power equipment; inquiries for boilers and engines are somewhat scattered, although occasional orders for equipment of moderate capacities are reported. The second-hand market for machinery, tools and power equipment continues to drag, reflecting the general condition of the trade.

Contractors have completed estimates on specifications for a one-story power house and laundry 77 x 92 ft. from plans by Zantzinger, Borie & Medary, architects, for the Masonic Home, Elizabethtown, Pa.

The contract for a new power house to be erected at Swarthmore College, Swarthmore, Pa., has, it is reported, been awarded to William Provost, Jr. The building will be 61 x 76 ft.

Guy King, 1513 Walnut street, architect, is asking for bids for construction and equipment of a small water works at Monuminkin Station, N. J.

J. Isaac Copeland & Bro., Clinton, S. C., hardware merchants, will erect a new store building 35 x 100 ft. and desire quotations on steel beams, hand power elevator and other equipment.

The contract for the warehouse and pipe shed to be erected for the H. B. Pancoast Company, 2243 South

THE MACHINERY MARKETS

Third street, at Front and Ellen street, has, it is stated, been awarded to F. A. Havens & Co.

Reports from Easton, Pa., state that the new plant of the Hawley Down Draft Furnace Company, Chicago, Ill., recently mentioned as having acquired a tract of nine acres in the suburbs of that city, to which it will remove on completion, will consist of a machine and boiler shop 60 x 175 ft., a foundry 60 x 97 ft. and an office building 75 x 78 ft.

The Standard Pressed Steel Company reports business very good. This company noted a decidedly better volume of business during the first six months of this year as compared with that of the same period in 1910. There has been a steady increase in the domestic demand for pressed steel hangers, while that from abroad holds up very well. Recent shipments for export have been made to Australia, Holland, Switzerland, Scandinavia, Italy and England. This company is considering an increase in its capital stock from \$100,000 to \$175,000 to provide additional working capital for its constantly growing business. Action in this matter will be taken by the stockholders on August 26.

Cleveland

CLEVELAND, OHIO, July 18, 1911.

The automobile manufacturers in Detroit and other Michigan points are now placing orders for their new machinery equipment for the coming season and this business has stirred up considerable activity among Cleveland machine tool manufacturers and dealers. While two or three of the automobile builders are making large plant extensions and are expected to need considerable additional machinery the business that is coming out at present from that source is for small lots of tools to replace worn out equipment or for new tools needed in the production of the 1912 models. The local situation shows very little change. Dealers are getting a moderate volume of small orders and have some new inquiries for from three to five tools. Machine tool builders generally report a better demand and an improvement in the outlook. A local company making drilling machinery reports that it has taken enough orders in the past two weeks to keep its plant running full for two months. The demand for automatic machinery shows more activity. Makers of handling machinery report an improvement in the demand for coal handling equipment. Several good inquiries are now pending from mining companies for coal tipples. The demand for power plant equipment is fairly active. In addition to new business that is coming out some orders that have been held up for some time are now about to be placed.

The fourth annual outing of the Cleveland Manufacturers' Club, composed largely of manufacturers in metal-working lines located in the St. Clair avenue district, was held at Dover Inn, west of the city, July 15. There was a good attendance and an enjoyable time was had. The programme included a dinner and several athletic events.

The Hartman Electric Mfg. Company, Mansfield, Ohio, has been incorporated with a capital stock of \$10,000 by R. W. Hartman and others.

The Cleveland Railway Company is planning the expenditure of \$2,500,000 for improvements during the next 12 months. This work has been held up for some time pending the enactment of an amendment to its franchise, which has finally been passed by the City Council. The money will be used for track extensions, buying from 150 to 200 new cars and for providing additional power equipment. It is expected that contracts will be placed shortly for some of the additional equipment.

W. F. Collins, 2091 East Nineteenth street, Cleveland, will build a new shop for the manufacture of dies, tools, machinery and metal stampings. New machinery equipment will be required, including presses, lathes, shapers and milling machines.

The Browning Engineering Company, Cleveland, has recently received orders for a 120-ton wrecker from the National Railway of Mexico and for a large portal crane from the American Bridge Company.

The Director of Public Service, Cleveland, will receive bids July 27 for a crane framework and track for the Kirkland pumping station of the water works department. On July 25 the same city official will receive bids for electric meters for the municipal lighting plant.

The Cleveland & Erie Machinery Company, Cleve-

land, has been incorporated with a capital stock of \$10,000 to deal in derricks, clam shell buckets and a general line of other second hand machinery used by contractors. The company will maintain one office at 1515 Rockefeller Building, Cleveland, and another at the office of the G. H. Williams Company in Erie, Pa. The officers are: G. H. Williams, president; C. C. Williams, vice-president, treasurer and purchasing agent; E. P. Lord, secretary, and William Ruddock, general manager.

The General Foundry Company, Warren, Ohio, will enlarge its plant by the erection of an addition 40 x 80 ft. to its main building, to be used as a core department, another factory building 50 x 80 ft., of steel, brick and concrete, and an office building 39 x 40 ft.

The Findlay Motor Company, Findlay, Ohio, which recently acquired the American Motor Truck Company, Lockport, N. Y., moving that company's plant to Findlay, has been reorganized as the Ewing-American Motor company with a capital stock of \$1,500,000, of which \$500,000 is preferred stock. L. E. Ewing, president of the Findlay Motor Company, will be president of the consolidated companies which will engage exclusively in the manufacture of commercial vehicles.

The Lees-Bradner Company, Cleveland, maker of gear cutters, has let contracts for the erection of a new plant at 6210 Carnegie avenue. It will be of brick and steel 50 x 150 ft. and two stories. A small amount of new machinery equipment will probably be required.

The Vulcan Steam Shovel Company, Toledo, Ohio, is building at Evansville, Ind., its new \$300,000 plant. The Arnold Company, Chicago, is the engineer.

The Miller & Hoy Mfg. Company, Wauseon, Ohio, will build a factory 50 x 140 ft. at Kendallville, Ind., this fall for the manufacture of tanks.

Cincinnati

CINCINNATI, OHIO, July 18, 1911.

The general business outlook continues promising, but actual orders received by a number of manufacturers are still somewhat disappointing. Several local firms are keeping a close watch on crop conditions all over the country, and late reports from their traveling men and correspondents show that the situation in agricultural districts is much better than the last Government report indicated. With the machine tool builders the export trade continues to occupy considerable attention, but not much encouragement is being received from the railroads or automobile manufacturers. The demand for sawmill and woodworking machinery holds up well, and it is reported that there is an improvement with the builders and dealers in power plant equipment.

The Cincinnati Commercial Association announces that the Superior Box Company, Superior, Wis., has decided to locate a branch here, employing about 25 men at the start. The former home of the Straub Machinery Company, at Sixth and Burns streets, will shelter the local plant.

Harry Hake, architect, Provident Bank Building, Cincinnati, is drawing up plans for a large fireproof garage to be erected on Mitchell avenue, by the Jungclas Auto Company.

Architect G. W. Drach, Union Trust Building, Cincinnati, will soon ask for estimates on a combination power and laundry building to be constructed for the Good Samaritan Hospital. The power plant equipment has not yet been purchased.

The Fosdick Machine Tool Company, Cumminsville, Cincinnati, Ohio, has recently acquired additional land adjoining its plant, but announces that it was not for the purpose of adding to its factory's present manufacturing facilities.

The Cincinnati Steel Castings Company, Cincinnati, has increased its capital stock from \$50,000 to \$100,000, and, it is reported, will make some extensive additions to its plant on Kenyon avenue.

The new addition to the plant of the Lodge & Shipley Machine Tool Company, Cincinnati, is now under cover and work on installing the necessary equipment will be begun some time next month.

It is reported that the Scioto Valley Traction Company, Columbus, Ohio, will soon begin work on large shops to be located at Reeses, Ohio.

The Reeves-Rigling Company, Hamilton, Ohio, manufacturer of hardware and household specialties, will soon have plans made up for a factory that will have about 15,000 sq. ft. of floor space. It will be of reinforced concrete construction.

THE MACHINERY MARKETS

It is rumored that the Illinois Leather Company will make some extensive additions to its Cincinnati plant. Building plans have not yet been made up.

Kirk & Blum, Cincinnati, will move into their new sheet metal factory in the western part of the city some time during August.

The Radio Mfg. Company is a new incorporation at Columbus, Ohio, with \$50,000 capital stock to make automobile radiators and other specialties. E. W. Brinker and J. C. Spangler are named among the incorporators.

It is rumored that the National Cash Register Company, Dayton, Ohio, is contemplating some additions to its plant. Plans have already been made up for an immense convention hall which will be the largest of its kind in the world.

Robert S. Mayer, Gerke Building, Cincinnati, Ohio, is the designing engineer for a heating system to be installed in a large proposed cigar factory that will be erected for the Fritz Bros. Cigar Company at Ninth street and Broadway, Cincinnati.

C. W. Moon, secretary of the Superintendents' and Foremen's Club, of Oakley, Ohio, announces that a dinner will be served the club members and their friends at Weber's café on the evening of July 20.

The Beredelli Construction Company, Fairmont, W. Va., has been awarded contract for the construction of 14 miles of the new Waynesburg & Blacksville Railroad and will start work some time next week.

Chicago

CHICAGO, ILL., July 18, 1911.

Although during the past week there has been a fair volume of miscellaneous sales of machinery, this business has been of such a scattering character as to make the general market seem quiet. Dealers report sales into Illinois and Wisconsin territory of a number of small tools and two or three instances of purchases aggregating from \$2,000 to \$3,000 are noted. Floor sales have been slow. Machine tool manufacturers continue to hold to their schedule of prices and departures from regular retail lists are confined to dealer's operations.

The car manufacturing plant of the Cudahy Company formerly located at Omaha is to be moved to East Chicago, Ind., where a new plant is to be built.

The Davenport Wagon Company, Moline, Ill., has been incorporated with a capital stock of \$300,000 for the purpose of dealing in and manufacturing wagons, agricultural implements, etc. The incorporators are William Butterworth, W. L. Velie, G. W. Mixter and G. N. Peeke.

The Rockford Tool Company, Rockford, Ill., has prepared plans for an addition to its plant 80 x 100 ft. The plant now occupied was entered only last fall and is already inadequate to the requirements of the company's business.

J. W. Love, Joliet, Ill., who is building a new factory, is in the market for a wood working planer.

Fred J. Postel & Co., Fisher Building, Chicago, engineers, will buy for the city of Geneva, Ill., two boilers complete with furnaces. Plans and specifications can be obtained from them.

Williams, White & Co., Moline, Ill., will be represented in Chicago by R. A. S. Johnson with offices at 1705 Fisher Building.

The United Iron Works, whose plant at Springfield, Mo., was damaged by fire, will rebuild the foundry building.

The Pleasant Prairie mills of the E. I. Dupont De Nemours Powder Company, which was blown up in March last, will be rebuilt in part on the same site near Racine, Wis.

A factory for the manufacture of corrugated iron pipe will be built at Pueblo, Col., by F. C. Hess, whose present address is Emporia, Kan. The estimated cost of the buildings is \$25,000 with a like amount additional for equipment.

The Elgin Metal Novelty Company, Elgin, Ill., has completed plans for a \$20,000 fireproof factory building to be located in that city. The main building will be 40 x 200 ft.

The Morrison Specialty Company, Morrison, Ill., is building a new plant in that city and is expecting to install new machinery.

The Springfield Drain Tile Company, Springfield, Ill., has been incorporated with a capital stock of \$30,000 with James A. Long and Chas. G. McIntosh, of Portland, Ind., and John F. Miller, of Springfield, as incorporators. A six-kiln plant will be erected for the

manufacture of sewer pipe and tile and later brick will be made.

The Root & Vandervoort Engineering Company, East Moline, Ill., has just let the contract for a \$25,000 addition to its foundry to be 100 x 150 ft. A new cupola and core ovens will be installed.

The city of Springfield, Ill., expects to purchase a 10,000,000-gal. pump for its water works station. Communications should be addressed to the city clerk.

The Langer Auto Castings & Foundry Company, Chicago, Ill., was incorporated with a capital stock of \$7,000. The incorporators are C. P. J. Langer, Joseph Von Craenen and John Holland.

The Couch-Cole Aeroplane Mfg. and Exhibition Company, Des Moines, Ia., will build an aeroplane factory in that city. The company expects to have some of its machines ready for trial in the very near future.

The Warner Instrument Company, Beloit, Wis., is completing the erection of a brass foundry of brick and concrete construction 32 x 50 ft. The company has sought to provide every facility for making this foundry complete and its equipment will be the most modern.

The Barr Clay Products Company will build a plant at Wanamingo, Minn., for the manufacture of clay building brick, silo brick and drain tile. Charles Roe, Kenyon, Minn., is president and H. S. Swann, Wanamingo, is treasurer.

The Star Mfg. Company, Albert Lea, Minn., builder of power hammers and disc sharpeners, will move its business to Waterloo, Ia., and is now building at Logandale Heights on a tract of 16 acres its new factory buildings. The main shop will be 60 x 160 ft.

The Zenith Mfg. Company, manufacturer of a combined hay loader and stacker, will build a new plant at Albert Lea, Minn.

The Sauk Rapids Water Power Company, Sauk Rapids, Minn., will construct an electric light and power plant.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad will rebuild at Waukesha, Wis., the roundhouse recently destroyed by fire at a cost of \$15,000.

The Consumers Power Company, Minneapolis, Minn., placed on record a \$10,000,000 mortgage the proceeds of which are to be used in the construction of power plants at points in Minnesota where the company has obtained control of water power. Mr. E. Holcomb is general manager.

The Oklahoma Harrow Company, Hutchinson, Kan., will erect a plant for the manufacture of harrows and other agricultural implements at that city in the near future.

The city of Onida, S. D., will spend \$11,000 for a municipal water works system.

The city of Sylvan Grove, Kan., is to vote a bond issue of \$25,000 to be used for the construction of a city water plant, and an issue of \$10,000 for an electric light plant.

The Kissel Motor Car Company, Hartford, Wis., is making an addition to its plant, 100 x 200 ft., four stories, of brick and mill construction. The building will be used for assembling, finishing and shipping, and some new manufacturing equipment will be installed, including two new boilers of about 150 hp.

Detroit

DETROIT, MICH., July 18, 1911.

The local machinery market this week has been decidedly spotty in character, but the volume of business on the whole is quite satisfactory, the bulk of the buying being done by the automobile trade. Dealers report a number of floor sales which, in the main, however, are confined to single tool propositions. Inquiries are very encouraging and the closing of some fair-sized orders which have been pending for some time seem to indicate a cheerful outlook for future business. Standard lines of machine tools are rather dull, the demand for special equipment being considerably better and a good deal of this business is being placed locally. Sales of small tools have fallen off, but the depression in this line is looked upon as only temporary. The market for second-hand machinery is below the average. There will probably be a good demand for shop supplies soon, as a number of concerns recently organized are making inquiries in this direction.

Building conditions continue to be quite active, awards being made on work of the larger type of construction, mostly brick and reinforced concrete factory buildings and additions and figures are being asked on a considerable amount of new work. Reports from the

E. DIESCHER & SONS,
Mechanical and Civil Engineers,
PITTSBURGH, PA.

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Saginaw Valley, the seat of the beet sugar industry, are to the effect that practically all of the 16 plants are increasing their capacity and making additions.

The Packard Motor Car Company has additions under way which will add four acres of floor space to the company's plant and greatly increase its capacity. The additions will include two new buildings for the truck factory each 60x320 ft., with connecting links from one building to another, a large addition to the foundry increasing its capacity 30 per cent. and an additional floor for each of the two service buildings which will permit an enlargement of the machine shop. A third floor will also be added to the foundry pattern shop. Construction work has been almost continuous since the company's establishment here in 1903.

The Peerless Crucible Steel Company is about to extend its plant by the addition of a foundry building one story of brick and steel construction.

The Timken Axle Company has awarded the general contract for a \$10,000 addition to the company's storage house to Nettleton & Weaver. The company reports a good volume of business and is running to nearly full capacity.

It is announced that the Artistic Model Corset Company, Cleveland, Ohio, has secured factory quarters here and will move its entire plant to this city next month. The company is also erecting a Canadian branch plant at Windsor, across the river from Detroit. H. F. Marsh and A. F. Marsh are president and secretary, respectively, of the company.

Through the efforts of the Detroit Board of Commerce the Zenith Carburetor Company, Lyons, France, has located here. The company was incorporated last week and has now secured factory space which it will equip at once for the manufacture of an annual output of 20,000 carburetors.

The Wolverine Motor Supplies Company, manufacturer of windshields, has filed notice of an increase of capital stock from \$2,500 to \$10,000.

The Hanson Tool & Die Company has incorporated with a capital stock of \$10,000. Frank Hanson, F. G. Morehouse and Edward Bullock are the principal stockholders.

The new Chevrolet Motor Car Company has taken over the factory plant of the Corcoran-Detroit Lamp Company which has a floor space of 75,000 sq. ft. and will begin the manufacture of motor cars as quickly as possible. The company will start with a capital stock of about \$750,000 and will be headed by William Little, W. C. Durant and Louis Chevrolet.

The Hayes Mfg. Company has started the erection of several new additions to its already large plant. There will be a three-story brick factory, a power plant and office building and three dry-kilns. The company is a large manufacturer of sheet metal parts and forgings.

The Abbey-Barnum-Cartwright Company has engaged in the manufacture of wire and metal work with an authorized capital stock of \$2,500.

The Best Stove Company has filed articles of incorporation with the Secretary of State, giving its capital stock as \$100,000. The principal stockholders are William J. Best, Harry B. Taylor and William Mervin.

The Weber Vending Machine Company has decided to move its factory from Detroit to Sandusky, Mich. The company manufactures a patent vending machine and is constructing special new machinery for use in its new plant.

The Eagle Tanning Company, Whitehall, Mich., is making extensive improvements to its plant. Two new buildings are in the course of erection, one being a manufacturing structure three stories 80x300 ft. and the other a steel and concrete vat house 80x225 ft. and of single story construction.

The Supervisors of Osceola County, Mich., have granted to John H. Haggerty the privilege of constructing a dam across the Muskegon River in that county. It is proposed to build a \$50,000 plant for the generation of electrical power.

The taxpayers of Ishpeming, Mich., have voted in favor of bonding for \$40,000 for a new fire hall and equipment.

Muskegon, Mich., will vote the present week on a proposition to bond for \$300,000 for the purpose of improving and extending the municipal water works system.

The Folding Fruit Box Company has been organized at Dowagiac, Mich., to manufacture a berry box recently patented by Alva West, of that city.

The Holland Printing Company with a capital stock of \$30,000 has been organized at Holland, Mich. Arend

Vischer is president and G. W. Mokma secretary of the new company.

The Mika Cooker Company, Saginaw, Mich., has decided to increase its capital stock from \$50,000 to \$100,000 to take care of rapidly increasing business.

A new industry has been incorporated at Ford River, Mich., to be known as A. W. Eddy & Co. The company has a capital stock of \$20,000 and will manufacture fish cleaning machines.

The South Aerial Engine Company has been organized at Traverse City, Mich., for the manufacture of an entirely new style of engine especially designed for use in aeroplanes. The capital stock of the new company is given at \$100,000.

There is a strong probability that the National Pressed Steel Wheel Company, Alexandria, Ind., will locate in Saginaw, Mich. The company has a capital stock of \$750,000 and manufactures pressed steel wheels for heavy vehicles.

Following changes in the management of the Saginaw Paving Brick Company, Saginaw, Mich., it is announced that the company's capacity will be largely increased and a larger amount of new equipment installed.

The Board of Public Works of Benton Harbor, Mich., is making preparations to expend the sum of \$50,000 in the enlargement and extension of the city's water works system. A large part of this amount will be used in increasing the capacity of the pumping plant.

A company with a capital stock in the neighborhood of \$100,000 for the manufacture of solid copper articles is being promoted in Hancock, Mich., by S. Segall. It is planned to manufacture percolators, chafing dishes and related articles.

Work on the new buildings of the Port Huron Paper Company, Port Huron, Mich., will be started immediately. The company, which has a capital stock of \$80,000, is headed by John E. Daley and will employ 300 men. It is stated that the Michigan Sulphite Fibre Company, also located in Port Huron, will consolidate with the new company.

A company has been organized at Allegan, Mich., by Henry Prichard and Ward Granger to engage in the evaporated fruit business. A large dry kiln equipment will be installed.

The lumbering interests of the northern part of the State are suffering severely from the destructive forest fires which are sweeping through that section. The immense mills of the H. M. Loud Lumber Company, Au Sable, Mich., were completely destroyed by fire which wiped out the town. Congressman Loud, president of the company, states that the mills will be rebuilt on a smaller scale. The mills of the Stevens Lumber Company at Waters and of the Mitchell Lumber Company at Millersburg were also burned. One of the largest industries at Alpena, Mich., was also seriously crippled by this fire, the tannery of Moench & Co. being partially destroyed at a loss of \$150,000. The company will rebuild its plant.

The Nice Furnace Company, Pontiac, Mich., is installing a set of oil burning furnaces at the Eastern Michigan Insane Asylum and a number of other State institutions are to be similarly equipped soon, it is stated. The company reports a good volume of business.

The city of Kalamazoo has decided to install an air lift system for increasing the inflow of water at the wells at the water works and \$3,000 has been appropriated for the purchase of the equipment.

Indianapolis

INDIANAPOLIS, IND., July 18, 1911.

John L. McCulloch, banker, Marion, Ind., who recently obtained a franchise for an artificial gas plant in that city, has entered into agreement with Rufus Dawes, of Chicago, controlling the gas interests of Muncie, Ind., to merge the Marion, Muncie and Hartford City companies. Gas plants will be erected at Marion and Muncie, and a gas holder erected at Hartford City. The three cities will be connected to the system by 8-in. mains.

The Elkhart Musical Instrument Company, Elkhart, Ind., has increased its capital stock from \$10,000 to \$25,000.

The Intermediate Lighting Company, New Albany, Ind., has been incorporated with \$5,000 capital stock to manufacture acetylene gas lighting machinery. The directors are L. D. and M. Youngblood and T. E. and M. E. Hancock.

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The South Bend Tire & Rubber Company has been organized at South Bend, Ind., and has taken an option on a site of 18 acres for \$18,000. The plant will cost \$25,000. Those chiefly interested are W. M. Blecker and W. A. Bentley, of Akron, Ohio, and M. G. O'Brien, of Mansfield, Ohio.

The Vincennes Sewer Association, Vincennes, Ind., has been incorporated with \$25,000 capital stock to construct a sewer system for that city and to lease its service, in accordance with an Indiana law enabling cities to enter into contract with private associations for public sewer purposes. The city may buy the system. The incorporators are P. M. O'Donnell, C. C. Winkler, C. W. Adams, R. A. Young and G. W. Sturtevant.

The New Process Lighting & Heating Company has been incorporated at Laporte, Ind., with \$50,000 capital stock, to manufacture and deal in gas and gasoline engines. The directors are C. F. Peterson, C. J. Nudelman, James Kolar, T. W. Steigler and H. B. Johnson.

The North Indiana Brick Company, Michigan City, Ind., has been incorporated with \$40,000 capital stock to manufacture brick. The directors are J. L. Jackson, E. D. Church, R. K. Rossegule, S. S. Roby and J. C. Reinke.

The North Manchester Foundry Company, North Manchester, Ind., has been incorporated with \$10,000 capital stock, to do a general foundry business. The directors are I. C. F. Martin, John Stauffer and W. J. Ranger.

The Anderson Gas Company, Anderson, Ind., has let the contract for a relief holder, oil tank, exhauster and cleaners to the Western Gas Construction Company, of Ft. Wayne, Ind. The contract for all other machinery was secured by the United Gas Improvement Company of Philadelphia. Gas will be manufactured from coke and oil.

The M. V. Cheesman Company, Mishawaka, Ind., has just added to its present plant a foundry, 52 x 130 ft. The company expects to increase its output of general castings and ornamental iron work.

The South

LOUISVILLE, Ky., July 18, 1911.

Business in this market is seasonably quiet, but reports coming to manufacturers and dealers indicate that prospects for fall trade are good. Builders of refrigerating equipment report that on account of the extremely good season for ice many operators have announced plans for enlarging their factories, and orders for additional equipment will be let in the fall. There is a good demand for elevators. Manufacturers of boilers say that the demand for power equipment is only fair. Crop conditions have improved as the result of more favorable weather, and this, it is believed, is a big change for the better.

Henry R. Worthington is installing a turbine-driven centrifugal pump in the plant of the Louisville Water Company. It has a capacity of 30,000,000 gal. per 24 hours. An interesting feature in connection with the installation is that the new machinery will replace two Cornish engines which have been in operation for 50 years, having been a part of the original pumping outfit of the company. They are still in good condition, and were manufactured by the old firm of Roach & Long, Louisville, which was the nucleus of the plant of Dennis Long & Co., afterward turned over to the United States Cast Iron Pipe & Foundry Company.

Arrangements have been made to begin work in the near future on the 18-story office building of the Inter-Southern Life of Louisville, at Fifth and Jefferson streets. Brinton B. Davis, of Louisville, is the architect.

The Norton Company, Louisville, will erect a business structure on the corner of Fourth and Market streets. The new buildings will require elevators and other equipment.

The Henry Vogt Machine Company reports the demand for power machinery fair, and excellent prospects for the next ice machinery season, though actual operations along this line are seasonably quiet. The outlook for the fall is excellent.

Some of the machinery at the local plant of the Alvey-Ferguson Company will be moved to the new plant at Oakley, near Cincinnati, and a few lines which have been made heretofore in Louisville will be discontinued. Otherwise the Louisville plant will be retained without change. The offices of the company will all be at Oakley. The company expects to be handling its business there by the latter part of August.

The Crescent Mfg. Company, Louisville, said to be the largest makers of store fixtures in the South, is contemplating the erection of an addition. Definite plans have not yet been worked out.

The Adams Fire Fighting & Instrument Company has filed articles of incorporation in Louisville with a capital stock of \$100,000. The purpose of the company is to manufacture fire extinguishers. The incorporators include David W. Adams, P. C. Johnson and C. M. Pate. Mr. Pate is the only Louisville incorporator, and is an officer of the Chess & Wymond Company.

The American Machine Company reports an excellent demand for elevators and good prospects in connection with ice machines. Business in the Southwest is exceptionally good, several large contracts having been secured from Dallas and other cities in that section.

The Board of Education of Louisville will shortly let a contract for the installation of a heating and ventilating plant in an annex of the Girls' High School. Sam Jones, business director, will receive bids. The estimated cost of the plant is \$18,000.

E. D. Morton & Co., Louisville, have received orders for a considerable amount of conveying equipment to be installed in the plants of the Louisville Cement Company at Milltown and Speed's, Ind.

A group of Louisville coal operators, including F. M. Sackett, I. B. Barnard and M. M. Bardwell, has purchased the property of the Edgemont Coal Company consisting of about 5000 acres in the Straight Creek district, in eastern Kentucky. The company plans to develop the property in the immediate future.

The City Council of Madisonville, Ky., has voted in favor of a bond issue of \$75,000 for the purpose of establishing water-works. The question will be voted on at the next election. A municipal lighting plant now in operation, and the two will be run jointly.

C. C. Hinton, Madison, Ind., is equipping a plant at Bowling Green, Ky., for the manufacture of cedar posts and lumber.

The Consolidation Coal Company, Baltimore, Md., which is building the industrial town of Jenkins, Ky., as quarters for its miners, has begun preparations to make several mine openings on its large holdings in that section. The company will be in the market for a great deal of equipment for these in the next few months. The purchases, it is understood, will be made through the Baltimore office.

The Bluegrass Fluorspar Company has been organized at Mexico, Ky., for the purpose of developing deposits of fluorspar, lead and zinc. H. C. Haase is secretary and treasurer, and in charge of the work, but the main office is to be in St. Paul, Minn.

H. E. Dickerson, Jackson, Tenn., is reported to be planning the establishment of a plant at Hickman, Ky., for the manufacture of hardwood products, including pulleys, boat oars, golf sticks, etc.

The county court at Henderson, Ky., has let contracts to the Vincennes, Ind., Bridge Company for the erection of two iron bridges at a cost of \$2300. The company already has several contracts for the construction of bridges in that county.

The John P. Dale Machinery Company, Nashville, reports good sales of boilers during the past few weeks. The demand for sawmills and other wood-working equipment is also said to be excellent.

The J. F. Galbraith Mfg. Company, Shelbyville, Tenn., is marketing a new double-lock metal shingle, and members of the company report that great success is being experienced in its distribution.

The Halo Gas Company has filed articles of incorporation at Nashville, Tenn. Its capital stock is \$4500, and A. J. White, J. M. Williams and L. J. Rust are among the incorporators.

Reports from eastern Tennessee and western North Carolina indicate that unusual activity is in evidence in the erection of new sawmills and the development of the timber lands of that section. Among the companies which plan expenditures in this direction are the Pittsburgh Lumber Company, Pittsburgh, Pa.; Champion Lumber Company, Canton, N. C.; R. W. Cox, of Scott County, Va., and others.

The Knox Stove Company, Knoxville, Tenn., has completed the erection of its plant, which has been under construction for the past three months, and is about to begin operations. The company is incorporated with \$100,000 capital stock. It took over the stove department of the Sanford-Day Iron Works, at the time it began business. The plant consists of three buildings besides the pattern shop. Hugh W. Sanford

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is president; A. B. Day, vice-president, and C. E. Randall, secretary and treasurer.

The Austin Western Machinery Company, Chicago, has sold through its Atlanta branch an outfit of road-making machinery to the road commissioners of Hamilton County, at Chattanooga, Tenn. Good roads activity in Kentucky and Tennessee is expected to result in the purchase of much new equipment of this kind.

P. C. Prowsnitzer, who has been manager of the mill supply department of Keith, Simmons & Co., Nashville, Tenn., has been appointed manager of that department of the Livermore Foundry & Machine Company, of Memphis, Tenn. Mill supplies constitute a new branch of the Memphis house.

May Bros., Memphis, Tenn., lumbermen, have announced that they will erect a large sawmill in that territory in the immediate future. Plans are now being drawn.

The sawmill of the Tremont Lumber Company, Tremont, La., which was recently burned at Eros, La., is to be rebuilt.

Doscher, Gardner & Co. will erect a planing mill at Jacksonville, Fla., to take the place of the plant which was recently destroyed by fire.

The municipality of Perry, Ga., has decided on a bond issue of \$6000 for the purpose of equipping a small lighting plant.

The Piedmont Portland Cement Company, of Portland, Ga., has decided to increase its capacity, and machinery is being contracted for. Still further extensions will be made as soon as plans in this direction are financed.

Frank Hill, Memphis, Tenn., is at the head of a company which is being formed at Mammoth Springs, Ark., for the purpose of establishing a water plant.

A gas plant is to be established at Jonesboro, Ark. provided a franchise is awarded to W. W. Cate and E. E. Randolph, who have made application for it.

A. D. Adair & McCarty Bros. are to erect a fertilizer plant at Roanoke, Va., and have purchased a tract of 28 acres for the purpose. Work of construction is to begin at once.

M. B. Bandas, Ragland, Ala., is authority for the statement that two gas plants are to be erected there. One, for the manufacture of plate glass, will cost \$800,000, and the other, which will produce bottles, will require an expenditure of \$125,000. Eastern capital is said to be interested.

The Virginia Bridge & Iron Company, Roanoke, Va., is to erect a new plant at Atlanta, Ga., and in addition to the structural iron shops will erect a machine shop, temple shop and power house. The material for the buildings will be supplied by the company, which has been operating a smaller plant near Atlanta for some time.

A steam turbine plant to generate about 1600 hp. is to be erected by the Anderson Water, Light & Power Company, at Anderson, S. C. The estimated cost of the new equipment is \$50,000.

The municipality of Hamburg, Ark., has taken over the water plant of W. E. Kittrell & Sons, and is contemplating considerable improvements.

J. H. Harris, of Union City, Ga., is asking for prices on a gasoline engine.

Bids will be closed by the municipality of Thomas-ton, Ga., August 1, for the erection of a water-works plant. The J. B. McCrary Company, of Atlanta, Ga., is the engineer.

Articles of incorporation have been filed at New Orleans, La., by the Schwartz Iron & Machinery Company, which is capitalized at \$10,000. The incorporators include Moses Schwartz, Walter B. Schwartz and Otto B. Schwartz.

The Gulf City Boiler Works, Mobile, Ala., has purchased buildings formerly used as a power plant and car barn by the White Line Railway, and will utilize the new structures for the manufacture of boilers and as a sheet metal working plant. The structures are being remodeled at a cost of about \$5000 and about \$15,000 will be spent in the purchase of new equipment.

The Smithfield Garage & Machine Company, Smithfield, N. C., has been organized to take over the plant of the Selma Iron & Machine Company of that city. The plant will be utilized for the manufacture of plumbing equipment and for making automobile repairs.

The Merrill-Stevens Company, Jacksonville, Fla., is having erected an addition to its machine shop, 45 x 50 ft., together with a 4-ft. gallery on two sides for lockers. The addition will provide room for a new horizontal boring machine, a 40-ft. lathe and other heavy lathes, all to be driven by independent motors.

An overhead track and traveling hoist will also be installed in addition to handle the work.

Eastern Canada

TORONTO, ONT., July 15, 1911.

All the pores of the demand continue open, and everybody in the machinery business appears to find trade sufficient to keep all the hands obtainable at work. The forest fires that swept over the gold fields of Northern Ontario destroyed many plants that will have to be replaced, as several of the mines in the Porcupine field are much more than proved prospects. There will be no abandonment of such properties. As a result of the fire the activities in that field are sure to be greatly increased. Prospecting will be made easier and the timber will be no longer an obstacle to be removed before mine working can be begun at some of the more hopeful interior claims. The construction to the camp of the branch line of the Temiskaming & Northern Ontario Railway is also an event of interest to all who desire to do business there. It will facilitate the bringing in of machinery and thus promote mine development and increase the demand for plant. The outlook for trade in mining machinery is getting brighter and larger as the population in the extensive mineralized area of Northern Ontario goes on increasing and spreading. There is reported to be a considerable demand for manufacturing plant for replacement and extension, and some on account of new industries. Railways are keeping up a good demand for equipment and contractors' outfit. It is expected that there will be a very large opening out of the farmers' demand for electrical apparatus when the plans of the Hydroelectric Commission and of some large transmitting and distributing companies to extend into the agricultural districts of Ontario are completed.

The president of the Canada Car & Foundry Company, Montreal, says the company's works at Amherst, N. B., will shortly have their passenger car manufacturing capacity increased 50 per cent.

The ratepayers of Hull, Que., have approved bylaws to expend \$158,000 on the construction of two fire stations.

The Coniagas Company's smelter plant at Harold, Ont., was badly damaged by fire on Tuesday, the smelter building and the coke building both being destroyed.

The hot rolling mill section of the Ontario Rolling Mills Company's plant, New Toronto, Ont.—a section very recently installed—was destroyed by fire this week.

Extensions and improvements are being made to the plant of the Belleville Rolling Mills, Belleville, Ont. Additional equipment is being installed and the furnaces are being rebuilt.

The Flexible Conduit Company, Penn Yan, N. Y., has decided to establish a branch plant at Guelph, Ont.

The Montrose Paper Company, St. Catharines, Ont., is arranging to install another paper machine. For this additional power will be required, and the company will build a new power house to generate about 1000 hp. An offshoot company, called the Inter-Lake Tissue Mill Company, has been formed to carry on business in works to be constructed beside those of the Montrose Paper Company. Equipment will have to be bought for the tissue mill as well.

Letters patent have been issued by the Dominion government to incorporate the Thomas Davidson Mfg. Company, Montreal, to carry on the business of smelting, casting, etc. The capital stock is \$500,000.

The Canada Flour Mills Company, Toronto, has been incorporated by the Dominion government with a capital stock of \$2,000,000.

The McElwain Shoe Company, Boston, Mass., has taken over the plant of the Sable Lumber Company, Liverpool, N. S.

The Hawes-Von Gal Company's hat factory at Niagara Falls, Ont., is now ready to have the machinery installed.

Bowman & Connor, engineers, 36 Toronto street, Toronto, will receive tenders up to July 27 for an intake pipe and filter basin for the town of Southampton, Ont.

The contract has been let for the construction of a \$2000 office and factory building in Montreal for the McClary Mfg. Company, London, Ont.

The Gillette Safety Razor Company has given a contract for the construction in Montreal of a five-story building to cost \$112,000.

The American Cyanide Company, Niagara Falls,

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Ont., is extending its factory and adding to its power plant. About \$66,000 will be expended on electric furnaces, retorts, cranes and conveyors.

The Toronto-Niagara Power Company, Niagara Falls, Ont., will spend \$500,000 on power house extension and equipment. Of this sum \$300,000 will go for generators, governors, turbines, penstocks, etc.

The Brake Beam Company, Buffalo, N. Y., is putting machinery into its Canadian factory at Brantford, Ont. A large quantity of machinery has arrived from Buffalo.

The Tollman Bros. Company, Hamilton, Ont., is making an addition to its foundry.

The Canadian Tungsten Lamp Company, Hamilton, Ont., will shortly begin the construction of a five-story addition to its works.

The Public Works Department of the Ontario government, Toronto, has awarded contracts for the construction of six important bridges to the Stratford Bridge & Ironworks Company, Stratford, Ont.

The Maximilian Machine Company, which started a few months ago to manufacture pneumatic hammers at Woodstock, Ont., has decided to wind up. For one thing, it is alleged, there was trouble between the company and the patentees.

The Gilmour Company's sash and door factory at Trenton, Ont., was destroyed by fire July 11.

The contract for the construction of Montreal's filtration plant has been awarded to F. H. McGuigan & Co., Toronto, for \$673,000.

The large sawmill owned by Sylvester Bent, of Belleisle, N. S., and situated at Young's Mountain, in that province, was almost completely destroyed by fire July 9. It had been burned to the ground less than two months before, and had just been rebuilt and re-equipped.

The sawmill and shingle mill on Calumet Island, in the Ottawa River, the property of the Riordan Paper Company, Montreal, were destroyed by fire July 12. The total loss was about \$250,000, mostly insured.

David Dick & Sons, Welland, Ont., have obtained the contract to build the waterworks' pump house for that town.

The Preston Woodworking Machinery Company has been formed and is calling for tenders for the construction in Preston, Ont., of a factory building, 100 x 100 ft., and a molding shop, 40 x 60 ft. The capital stock is \$100,000. W. S. Hudson, president of the company, is managing director of the Canadian Office & School Furniture Company, of the same town. The mayor of the town, M. H. Mullin is vice-president and managing director, and W. J. Murray, Preston, is manager of works. All are men of practical experience.

The St. Mary's Cement Company's plant at St. Mary's, Ont., will cover five acres. The plant is being constructed by the Hunt Engineering Company of Kansas.

G. E. Amyot, president of the Dominion Corset Company, whose plant at Quebec City was recently burned down, says the company will rebuild there, accepting the City Council's offer of exemption from taxation.

The Goodyear Tire & Rubber Company has decided to add to its works at Bowmanville, Ont., by the construction of a three-story building, to cost \$50,000. When the new building is equipped with machinery from 300 to 500 additional men will be employed by the company.

Western Canada

WINNIPEG, MAN., July 15, 1911.

A serious question is the continuing strike of the miners in the Crow's Nest and Southern Alberta coal fields. If the mines are not soon started the West will be in a very bad plight for fuel for domestic, manufacturing and railway purposes. The money question, too, is worrying all business men who have been drawn into the real estate boom, for they have been given to understand by the banks that they must make sure to set their business affairs in order if they are to have the financial assistance that is deemed adequate by the latter for business needs. The banks have so large a commercial demand to attend to that it will be impossible for them to help customers to carry real estate. These will have to realize and bring the money into their business in many cases.

Foley, Welch & Stewart, railway building contractors, Winnipeg, are reported to have decided to join forces with the Northern Construction Company. They are both concerns of very large operations. The

Canadian Northern Construction Company is under the same controlling interests as the Canadian Southern Railway Company.

Carlyle Moore, of Red Deer, Alberta, vice-president of the Alberta Central Railway Company, says that company will have 100 miles of track under construction next fall. It is now building into the Brazeau coal field.

New pumps have arrived in Victoria, B. C., for the salt water high-pressure fire system of that city. They are to take the place of machinery that was supplied by an American contractor two years ago. They were made in Manchester, England. Two of the pumps are electrically driven, and one is steam driven.

The Gordon Nail Company has obtained from the City Council of Calgary, Alberta, a site of four acres on which to erect factories.

The contract for the construction of the plant of the Port Arthur Wagon Company, Port Arthur, Ont., has been let to the Canadian Stewart Company, Montreal.

The General Storage Corporation is the name of a company that has been formed, presumably under Canadian Northern Railway auspices, to erect and operate at Port Arthur, Ont., the largest general freight storage and cold storage plant in Canada. The cost of the plant is to be about \$1,000,000.

The Canadian Northern Railway Company is said to be about to establish at Fort Frances, Ont., a plant at a cost of \$150,000 for the creosoting of ties.

The British Collieries, Ltd., with a capital stock of \$5,000,000, has been incorporated under Dominion letters patent to carry on coal and other mining operations. The head office is to be in Winnipeg.

The Edmonton Iron Works Company, Edmonton, Alberta, will greatly enlarge its plant and go exclusively into the manufacture of breaking plows.

Gordon, Ironsides & Fares, Winnipeg, have begun the construction of a meat-packing plant at Moose Jaw, Sask., to cost \$150,000.

The cities of Fort William and Port Arthur, at the head of Lake Superior, made a joint bid for the Canadian Pacific Railway Company's locomotive repair shops in the West, but Sir William Whyte, the vice-president, said it would be impossible to make advantageous use of a location east of Alberta province, as by the time the shops are built the company will have ready for them about 800 locomotives in its territory between the mountains and the Western Manitoba boundary. Sir William said, however, that he considered the company's terminal point at the head of the lakes an ideal spot for car building shops, and intimated that the company might soon be open to discuss the idea of locating car works there.

Seaman & Penniman, Fort William, Ont., have obtained the contract to construct the smelting works that the Mond Nickel Company is putting up at Sudbury, Ont.

The first two units of the Point de Bois power plant, owned by the city of Winnipeg, will be ready for operation and prepared to turn out 8000 hp. for the use of manufacturing and domestic consumers by Aug. 15. Three additional units, good for another 12,000 hp., will be ready by Dec. 1. Other units will be installed as required, and by degrees the total capacity of the plant will be raised to 100,000 hp. The generators and exciters for the units are being erected by Vickers Sons & Maxim, Sheffield, England. The Canadian Westinghouse Company, Hamilton, Ont., is putting in the transformers and the switchboards, and also the general electric auxiliary apparatus. The G. Norton Boving Company is installing the turbines.

The University of Calgary will spend \$150,000 on the construction and equipment of college buildings at Calgary, Alberta.

A. C. Stielow, Milwaukee, has been negotiating with the Bull River Power Company, whose works are near Fernie, B. C., and with the Board of Trade of Fernie, concerning a proposal to erect and operate a pulp mill in that town.

It is said that the International Harvester Company's distributing plant, at Fort William, Ont., for one section of which the contract for the foundation has been let, will cost \$400,000 when completed.

Alex Bruce & Co., representing a Scotch and English syndicate, has purchased a site at Fort Frances, western Ontario, and will begin the erection of a big creosote plant for treating railroad ties.

The general manager of the Hines Lumber Company has been at Fort Frances looking over the ground with a view, it is said, of building a sawmill to cut the timber on the company's holdings in that district.

THE MACHINERY MARKETS

The Carter-Halls-Adlinger Company, Ltd., Winnipeg, has secured the contract for building a roundhouse and shops at Regina, Sask., for the Grand Trunk Pacific Railway Company.

The Kerrobert, Sask., Board of Trade has arranged with the Western Farmers' Grain Company for the construction of a flour mill at that point, with a capacity of 100 barrels.

The Maple Leaf Milling Company, Ltd., Brandon, Man., has taken out a permit for the erection of an elevator there.

It is announced that the Swift Canadian Company, Ltd., headquarters Winnipeg, will establish a packing plant at Fort William.

William Hutchinson, Winnipeg, inventor and patentee of a moldboard harrow, is negotiating with the Council of Battleford, Sask., to organize a company to be known as the Battleford Iron Works Company, Ltd., for the purpose of manufacturing there. It is stated that considerable of the stock has already been subscribed for. The Council is making a grant of a site, and is submitting a by-law for a grant to cover the cost of a suitable building.

St. Louis

St. Louis, Mo., July 15, 1911.

The week in the machine tool market has been a quiet one. No large lists have come out for quotations and no especially large deals have been closed. There has been a fair movement along ordinary lines and dealers still doing as much business as has been the case during the past few months. Inquiries have been increasing in some quarters, while others report that there has been nothing of moment in the requests for prices which they have received. There is still an optimistic feeling among the dealers, but it seems largely to be based on a belief that it will not be possible to go much farther on the present road without coming to a turn. The increased demand for electrical equipment has dropped back to ordinary conditions now that the sharp requirements of the hot spell have been cared for.

The Rotary Washing Machine Company's manufacturing plant, employing 150 men, was completely destroyed by fire the past week and rebuilding on a larger scale has been decided upon. Complete new equipment will be required.

Ground has been broken for a new freight terminal for the Cotton Belt system at St. Louis. It is to be the largest in the city and is to be equipped with the latest of mechanical loading and freight handling devices. About \$570,000 will be spent on building and equipment.

The F. Burkart Mfg. Company has bought a site, 150x310 ft., and will erect an entirely new plant for the manufacture of upholsterers' supplies, large enough to enable the employment of a force double the present factory capacity.

The St. Louis Shipping Case Company has been incorporated here with \$50,000 capital stock by C. K. Berg, O. K. Berg and Emil Granberg, and will equip a plant for the manufacture of knock-down shipping cases.

The Bessemer Coal Mining Company, with \$121,700 capital stock, headquarters in St. Louis and mine at Marissa, Ill., has been incorporated for the equipment and operation of a mine in the soft coal district just east of St. Louis, on the Illinois side of the river.

The General Chemical Company, New York, has closed a deal for a 90-acre tract in East St. Louis, Ill., where it will establish and equip a plant for the manufacture of all its products for Western and Southwestern distribution. It will have switch connection with the Vandalia Railroad and will employ about 1500 men. It is expected to have the plant in operation in about six months.

The Stout & Parke Foundry, Carthage, Mo., has been taken over by the Standard Machine & Mfg. Company. The company manufactures tractors and drilling machines, and will add improvements to the present plant. M. S. Parsons is manager.

The city of Shelby, Mo., has voted to install a water-works and sewage system at a cost of \$84,000.

The Imperial Clock Company, St. Louis, Mo., has been incorporated with a capital stock of \$100,000 to manufacture clocks. The incorporators are R. E. Hayes, Peter H. Huck and others.

The Dolly Foundry Company, Pine Bluff, Ark., has been sold to the English Foundry Company, the consideration being \$25,000.

The Iowa Valve Company, Oskaloosa, Mo., recently

incorporated with \$100,000 capital stock, has taken over the plant of the Iowa Mfg. Company at Estherville, Mo.

The Pacific Coast

Portland, Ore., July 11, 1911.

A few isolated orders for heavy tools, cranes, etc., have been placed recently and business has accordingly been larger than for some time previous. There is no general activity in this class of equipment, however, as well-established plants are buying very little heavy machinery and with no new inquiries of much importance coming out there is little likelihood of any material improvement for several months. Metal working tools of a small nature continue in fair demand, but there is no great activity in any line.

Orders are coming in freely for wood working machinery, though most of the individual installations are small. Most of the logging camps along the Columbia River closed the first of the month and may remain idle for a week or two more. Meanwhile, however, considerable overhauling is being done and quite a number of donkey engines, locomotives, etc., have been sold. Other types of machinery continue in active demand, though many industrial enterprises are projected from which no business is yet in prospect.

A large double-hook Shaw electric crane has been ordered for the Colman dock, Seattle, Wash.

The Western Steel Corporation, Seattle, Wash., which has been operating on a small scale for several months, is gradually increasing its facilities and has just placed an order for a ladle crane.

The Perfection Automatic Gas Machine Company, Los Angeles, Cal., has opened an office at Vancouver, Wash., and expects to start a factory there.

It is announced that work will be started at once on the new car shops of the Portland Railway, Light & Power Company adjoining the Southern Pacific shops in this city, the estimated investment being about \$400,000.

The Howard Automatic Switch Company has secured the Frazer foundry, Springfield, Ore., as the nucleus of its projected factory. Two more buildings will be erected and a lot of machinery installed.

The Wylie Bros. Company is erecting a plant for the manufacture of road building and irrigating equipment at the foot of Seventeenth street, this city.

The city of Portland has placed an order for boilers for the municipal fireboat with the Ballin Water Tube Boiler Company, this city, at \$17,500.

The West Coast Wagon Company, Tacoma, Wash., has taken a contract to furnish steel bands for a 15-mile stave pipe to be built for the city of Tacoma by P. E. McHugh. The order amounts to about 2500 tons.

The city of Portland has selected a site for the municipal rock crushing plant to be erected on the Bull Run pipe line.

The Oregon & Washington Railroad is installing a cinder conveyor at Seattle, Wash.

J. H. Chambers, Cottage Grove, Ore., is preparing to replace his saw mill, which was burned recently.

The Garrow Lumber Company is preparing to rebuild its saw mill at Corvallis, Ore.

Secor Bros. are planning to install a quarry and crusher near Kelso, Wash., to be operated by electricity.

It is reported at Everett, Wash., that the Great Northern Railway interests will establish a railroad tie mill there.

The Oregon & Washington Railroad & Navigation Company will erect steel coal bunkers at Huntington, Ore.

The Jamieson Building, Spokane, Wash., is to be remodeled and an electric light and elevator power plant installed. N. R. Tooten is the manager of the building and M. S. Gilbranson is consulting engineer.

The American Forge Company, which recently leased a site on Tehama street near Second, San Francisco, expects to occupy a new building at this location about the first of the year, when the present facilities will be tripled. Joseph Eastwood, president of the company, has just placed an order with the San Francisco office of Manning, Maxwell & Moore for a special 8000-lb. double frame Chambersburg steam hammer, which will be the largest on the coast. This installation is intended to take care of the heaviest marine forgings.

The San Francisco office of Manning, Maxwell & Moore has taken an order for the principal requirements of the new Standard Oil plant at El Segundo, near Los Angeles, including a number of large machine tools and plate rolls for the tank shop.

THE MACHINERY MARKETS

The Oil Well Supply Company, Los Angeles, has placed orders for a number of large lathes.

The new buildings at the Union Iron Works, San Francisco, will be used to house some of the present shops, including the marine structural shop. No information is given out as to plans for additional equipment.

Texas

AUSTIN, TEX., July 15, 1911.

One of the notable and important features of the industrial situation in Texas is the large number of projects that will require a great amount of machinery which are on foot. These not only include important irrigation enterprises, but manufacturing plants of various kinds. It is claimed by men who are interested in bringing about the consummation of these different projects that it is now much easier to interest capital in investments of this character in Texas than formerly. The prospects are favorable for the inauguration of considerable new railroad construction both in Texas and the Southwest generally, as well as in Mexico before the close of the present year. The industrial situation in Mexico shows but slight improvement. Labor troubles continue to give the owners of mines and manufacturing plants much annoyance.

The Chamber of Commerce is promoting the erection of a new steel bridge across the Neches River, at Beaumont. The matter is now before the Board of County Commissioners.

The Gulf, Colorado & Santa Fé Railroad Company has let the contract for the installation of an engine and boiler house of Silsbee, Texas, to H. D. McCoy, of Cleburne, Tex., for \$22,000. He was also awarded the contract for the construction of a power house at Cleburne for the road to cost \$13,000.

The City Commission of Austin has accepted the proposition of the Hydraulic Properties Company, New York, for the construction of a dam across the Colorado River and the installation of hydroelectric plant, the agreed consideration being \$1,600,000. The proposed contract will be submitted to a vote of the people of the city for ratification or rejection. The date of the election has not yet been named.

The East Texas Brown Ore Development Company has been formed with general offices at Port Bolivar. Its capital stock is \$2,500,000. The incorporators named in the charter are Lewis P. Featherstone and Fox Winnie, of Galveston, and L. C. Luckel, of Houston. The company is developing large iron ore deposits in Cass County.

The Durango Land & Timber Company has been formed in Waco, Texas, with a capital stock of \$570,000 for the purpose of erecting lumber mills and developing a large tract of timber in the state of Durango, Mexico. The incorporators are E. Rotan, H. H. Shear and Charles Hamilton, all of Waco.

The Commercial Club of Bryan is promoting the installation of a cold storage plant at that place.

The Miller-Brooks Mfg. Company has been formed at Jacksonville. The incorporators are F. J. Miller, A. L. Brooks and R. C. Miller. The capital stock is \$25,000.

The Producers' Turpentine Company is arranging to operate in Texas and has established offices at Beaumont. It has a capital stock of \$100,000.

R. L. Sparrman is erecting a corn mill at Ennis, Texas.

A committee of the City Council is investigating the different types of garbage crematories preliminary to awarding the contract for the installation of one at Temple, Texas.

H. Wunderlich, of Waco, will install a five-stand cotton gin at Belton.

James Teutsch is building a cotton gin at Nacogdoches.

The woodwork mill of the International & Great Northern Railroad at Palestine, which was recently destroyed by fire, entailing a loss of about \$55,000, will be rebuilt. Considerable new machinery will be required.

The taxpayers of New Braunfels have voted to issue \$67,000 of bonds for the construction of a dam across the Guadalupe River, at New Braunfels, and other improvements. A hydroelectric plant and waterworks pumping station will also be installed at the dam.

The Sadler & Czigin Light & Power Company has taken steps towards erecting an ice plant at Sour Lake.

S. H. Wadley, of Greenville, has applied to the City

Council of Pecos, Texas, for a franchise to construct a sewer system. The city contemplates putting in its own plant.

The Potash & Soda Company, Monahan, is preparing to develop on a large scale the chemical deposits in Bitter Lake, in Ward County. Borax, gypsum, sulphate and sulphide of soda and other chemicals are found there in abundance, it is stated. The company will also erect a cement manufacturing plant. B. P. Bailey, of Fort Worth, is president.

Government Purchases

WASHINGTON, D. C., July 17, 1911.

The Isthmian Canal Commission, Washington, will open bids August 4, under canal circular 640, for one turbo generator unit, 500 kw., and one 15-ton road roller.

The Paymaster General, Navy Department, Washington, will open bids August 8 under schedule 3749 for two saddles for multiple drilling machines for delivery at Mare Island, Cal.

The Bureau of Yards and Docks, Navy Department, Washington, opened bids July 8 for boilers and auxiliary power plant equipment for the United States naval station, Pearl Harbor, T. H., as follows:

Item 1, power plant equipment complete, Evans-Almirall & Co., New York, \$167,000; U. L. Bayard, Philadelphia, Pa., \$158,000; Benham Young Company, Honolulu, T. H., \$169,182.57; Charles C. Moore & Co., San Francisco, Cal., \$158,000; John W. Danforth Company, Buffalo, N. Y., \$153,495 and \$147,500.

The Bureau of Yards and Docks, Navy Department, Washington, opened bids July 8 for auxiliary power plant equipment for the United States navy yard, Mare Island, Cal., as follows:

Item 1, power plant equipment complete, Evans-Almirall & Co., New York, \$108,987; C. C. Moore & Co., San Francisco, Cal., \$114,100; Robert Dalziel, Jr., San Francisco, Cal., \$112,600; John W. Danforth Company, Buffalo, N. Y., \$103,570.

The Lighthouse Inspector, San Francisco, Cal., opened bids June 27 for lathe and tools for the machine shop, Yerba Buena Lighthouse Depot, Cal., as follows:

Pacific Tool & Supply Company, \$597.65; Compressed Air Machinery Company, \$583.20; C. W. Marwadel, \$835.65; A. L. Young Machinery Company, \$557 for lathe only; J. L. Hicks, San Francisco, Cal., \$661.55; Harron, Rickard & McCone, San Francisco, Cal., \$728.66; Manning, Maxwell & Moore, New York, \$882.81; Dicks Compressed Air & Drill Company, \$753.15; Eccles & Smith Company, San Francisco, Cal., \$826.09.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids July 11 as follows:

Schedule 3718, class 51, one engine lathe—Bidder 17, Chandler-Farquhar Company, Boston, Mass., \$1,003 and \$1,108; 37, Fairbanks Company, Washington, D. C., \$1,067 and \$1,132; 43, Garvin Machine Company, New York, \$1,180.48; Griscom-Spencer Company, New York, \$1,078; 58, I. H. Johnson, Jr., Company, Philadelphia, Pa., \$1,163; 80, Manning, Maxwell & Moore, New York, \$1,579; 88, Niles-Bement-Pond Company, New York, \$1,260 and \$1,443; 92, Prentiss Tool & Supply Company, New York, \$1,400 and \$1,190; 131, Springfield Machine Tool Company, Springfield, Ohio, \$1,346.

Class 52, one motor-driven plain radial drill—Bidder 17, Chandler-Farquhar Company, Boston, Mass., \$859; 37, Fairbanks Company, Washington, D. C., \$817; 48, Griscom-Spencer Company, New York, \$896; 63, J. P. Kemp, Baltimore, Md., \$894; 80, Manning, Maxwell & Moore, New York, \$1,000; 88, Niles-Bement-Pond Company, New York, \$855; 92, Prentiss Tool & Supply Company, New York, \$892 and \$930.

Class 53, one motor-driven shaper—Bidder 17, Chandler-Farquhar Company, Boston, Mass., \$859; 37, Fairbanks Company, Washington, D. C., \$787; Garvin Machine Company, New York, \$961; 48, Griscom-Spencer Company, New York, \$859; 60, R. A. Kelly, Xenia, Ohio, \$791.50; 63, J. P. Kemp, Baltimore, Md., \$765; 80, Manning, Maxwell & Moore, New York, \$813 and \$873; 88, Niles-Bement-Pond Company, New York, \$975; 92, Prentiss Tool & Supply Company, New York, \$810; 131, Springfield Machine Tool Company, Springfield, Ohio, \$872.

Class 54, one motor-driven sensitive drill—Bidder 37, Fairbanks Company, Washington, D. C., \$167; 143, Garvin Machine Company, New York, \$170; 48, Griscom-Spencer Company, New York, \$163; 80, Manning, Maxwell & Moore, New York, \$140, \$164 and \$179; 92, Prentiss Tool & Supply Company, New York, \$173.65 and \$185.72.

Class 55, one motor-driven speed lathe—Bidder 1, American Woodworking Machinery Company, Rochester, N. Y., \$305; 37, Fairbanks Company, Washington, D. C., \$227; 48, Griscom-Spencer Company, New York, \$199.35; 89, Oliver Machinery Company, New York, \$179, \$187, \$222 and \$230; 92, Prentiss Tool & Supply Company, New York, \$130.42 and \$293.30.

Class 156, one motor-driven emery grinder—Bidder 19, James A. Clark, Jr., Electric Company, Louisville, Ky., \$130; 21, Cincinnati Electric Tool Company, Cincinnati, Ohio, \$146; 24, Diamond Machine Company, Providence, R. I., informal; 37, Fairbanks Company, Washington, D. C., \$116; 63, J. P. Kemp, Baltimore, Md., \$126.50; 80, Manning, Maxwell & Moore, New York, \$171.75 and \$188.80; 100, Sampson Mfg. Company, Oshkosh, Wis., \$190.

Class 61, one oxy-acetylene welding plant, one acetylene generating outfit and one gas scrubber—Bidder 26, Davis-Bournville Company, New York, \$4,500 and \$5,205; 90, Oxi-Carbi Company, New Haven, Conn., \$4,490.60, part.

The bid of the American Tool Works Company, Cincinnati, Ohio, for one single-gear crank shaper, under schedule 3658, class 34, was \$326. It was erroneously given as \$236 in our issue of July 6.

